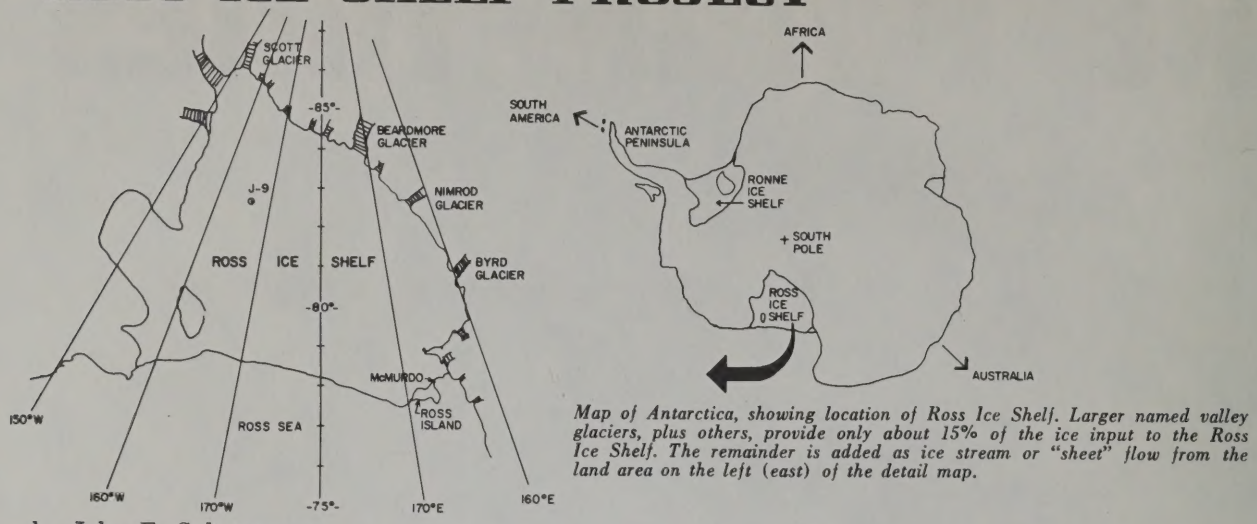
THE POLAR TIMES

ROSS ICE SHELF PROJECT



Map of Antarctica, showing location of Ross Ice Shelf. Larger named valley glaciers, plus others, provide only about 15% of the ice input to the Ross Ice Shelf. The remainder is added as ice stream or "sheet" flow from the land area on the left (east) of the detail map.

by John F. Splettstoesser

The Ross Ice Shelf, one of the world's last unexplored areas, is one of the two largest ice shelves in the world (the Ronne Ice Shelf is the other), one of perhaps a total of 20 ringing the continent of Antarctica. An ice shelf is a mass of glacier ice attached to a land mass and floating on the ocean. Its ice is formed mainly from snow precipitation and accumulation on land. The snow has since been compacted and converted into ice, which has since flowed slowly from the continent onto the sea. As the ice moves slowly seaward toward the ice front, it calves into icebergs that float away with the wind and ocean currents and eventually disintegrate and melt. In the case of the Ross Ice Shelf, the ice front has shown little variation in position since it was first observed, implying a state of equilibrium.

The Ross Ice Shelf is named for Capt. (later Sir) James Clark Ross, who discovered it in January 1841. Its area is about 520,000 sq km (a little less than the size of France; or a little more than 2½ times the size of Nebraska), and it is approximately pie-shaped with the seaward side consisting of an ice barrier about 30 m above the water. The ice shelf thickness ranges from about 240 m to 600 m and there is about 300 m of water beneath the shelf. In at least one place, the shelf is grounded on a rise of the ocean bottom.

The Ross Ice Shelf Project (RISP) Management Office was established at the University of Nebraska, Lincoln, in June 1972 under the direction of the (then) Chancellor of the University, Dr. James H. Zumberge. Dr Zumberge has had long-time interests in the Ross Ice Shelf, and conducted field research there during the International Geophysical Year, 1957-58. Dr. Robert H. Rutford became the first full-time Director of the RISP Office in June 1972. He left in April 1975 and is now Director of the Division of Polar Programs at the National Science Foundation.

The general objectives of the Ross Ice Shelf Project are to investigate the physical, chemical, biological and geological conditions within and beneath the Ross Ice Shelf to determine how they relate to the ice itself, the water mass, the ocean floor, and the subsea sediments (Zumberge, 1971). Specific questions to be answered as part of RISP are listed by Zumberge and in the *RISP Science Plan* (Ross Ice Shelf Project Steering Group, 1974).

Surface Measurements

The first step in the examination of the Ross Ice Shelf involved a geophysical and glaciological program that began in the 1973-74 field season and should be completed in the 1977-78 season. This program is designed to measure ice and water thicknesses, snow accumulation, surface movement and strain, and response of the shelf to ocean tides. Transportation for field party movement from base camps to remote geophysical and glaciological stations has been provided by ski-equipped Twin Otter aircraft.

The Ross Ice Shelf Geophysical and Glaciological Survey (RIGGS) has been conducted on an approximate 50-km grid network providing information on the ice shelf thickness and movement, as mentioned previously. At each of the stations, a glaciological team sets out a network (rosette) of poles and surveys them very accurately to determine the configuration. Each station is located with reference to the Earth by means of a Geoceiver, an instrument that provides satellite-derived positions to within 5 m accuracy. Each of these stations is visited the following season to determine movement of the shelf at that location and possible movement (strain) within the rosette. In addition, a 10-m-deep core is hand-augered to determine the annual accumulation, and a temperature reading is taken in the bottom of the hole to determine the average annual temperature at that location. At a few selected locations, stations are set up for the entire season to measure the effects of ocean tides on the ice shelf. On the same 50-km grid, a geophysical team measures ice thickness and water depth by seismic means and a pulsed radar. Gravity measurements are made to detect variations in underlying rock type, and seismic refraction data provide information on earth crustal layering and structure beneath the seabottom.

The Polar Times

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No. 85 *DECEMBER 1977*

Drill Pierces Ice Shelf, Opening 'Lost World'

By WALTER SULLIVAN

Using a rocket type of drill to blast through 1,380 feet of ice, engineers have penetrated into a "lost world" extension of the Pacific Ocean beneath the ice of Antarctica.

Successful piercing of the Ross Ice Shelf came almost a year after an earlier attempt was suspended last Dec. 14 when, at a coffee break and crew change, the ice flowed together and immobilized a more conventional drill bit.

Within a few days, scientists hope to lower a television camera through the hole, whose minimum diameter is 10 inches, to see what creatures may have adapted to life beneath the shelf.

The region under the drill site, an oceanic realm equal in area to Spain, has been cut off from sunlight and the atmosphere for thousands and perhaps millions of years.

Samples and Photographs

Nets and traps, as well as devices to sample and photograph the sea floor, will be lowered through the hole. Water beneath the shelf at this point is 660 feet deep. It is not entirely isolated because it is linked by deep-water currents with the Ross Sea and Pacific Ocean.

A major goal is to assess the hypothesis that at times large sections of the inland ice slip rapidly into the ocean, raising sea levels worldwide. Such "surges" in the past may have drained ice from West Antarctica, whose ice streams are primarily responsible for feeding the Ross Ice Shelf.

The drill site, 470 miles southeast of the American base at McMurdo Sound, is in an extension of the main ice stream from West Antarctica, much of which is known as Marie Byrd Land. Every day the site moves about three feet toward the Ross Sea, where the ice shelf breaks up into large, flat-topped icebergs.

Flow of Ice Impeded

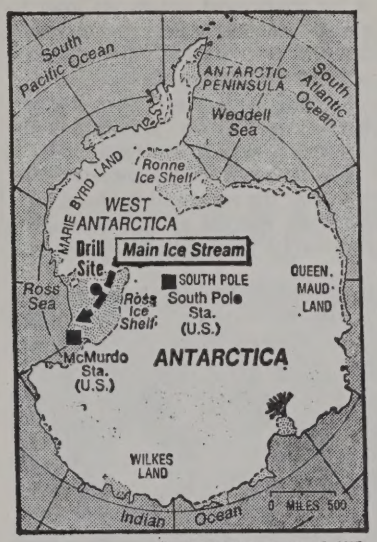
One hypothesis has been that the Ross Shelf acts as a dam impeding the flow of ice from West Antarctica and that, if it all broke up into icebergs, the flow rate might increase dramatically. Observations beneath the ice may show whether the shelf has broken up periodically.

It is known from studies of the Ross Sea floor that in the past the shelf has extended hundreds of miles farther north than today and has thickened enough to scour the bottom.

The drilling effort, known as the Ross Ice Shelf Project, is financed by the National Science Foundation.

Scientists from several nations, including Australia, New Zealand and the Soviet Union, have been waiting for the breakthrough so that they can conduct a variety of experiments.

Dr. Duwayne M. Anderson, chief scientist for polar programs at the foundation, said yesterday that winches were being



The New York Times/Dec. 9, 1977

moved into place lower and haul out their instruments.

Avoiding Contamination

Last year, the drill jammed less than 300 feet from the bottom. Heat from the ocean apparently made the ice at that depth sufficiently plastic to flow more rapidly than expected. Usually in drilling so deep, the hole is kept filled with fluid to counter the tendency toward closure but, to avoid contamination of the ice and water samples, this was not done.

The plan for this year was to free the drill by circulating hot water through the hole. This was tried several times, but the flow was not sufficient to do the job.

The drilling project, coordinated by Dr. John W. Clough of the University of Nebraska, therefore turned to James A. Browning of the Browning Engineering Company near Hanover, N.H.

The Browning drill, fueled by a diesel type of oil, generates a supersonic jet of hot gas to bore through granite in quarrying operations. Mr. Browning took one to Antartica and in less than 10 hours it cut a hole that in some sectors was 2 feet wide. As it blasted its way through the ice shelf, the chips of ice were melted by the heat, partly filling the hole with water.

Sea Water Overflows

At the breakthrough, however, sea water rushed into the hole, which rapidly filled and overflowed onto the ice. The water subsided, then overflowed again in a succession of diminishing oscillations.

Efforts to free the other drill will continue, but if they fail it is planned to lower an explosive charge to the bottom and blast the drill stem free. It could then be hauled out and used to drill a smaller hole nearby, from which ice cores just under 3 inches in diameter could

TRACES OF LIFE FOUND UNDER ROSS ICE SHELF

Scientists in Antarctica Project Lower a TV Camera and See 2 Fish Near the Seabed

LINCOLN, Neb., Dec. 16 (AP)—Scientists conducting the first experiments beneath a 1,375-foot ice shelf in Antarctica saw two fish swimming near the seabed, proof that life exists in the frigid, sunless waters, according to scientists.

Officials at the Ross Ice Shelf Project management office at the University of Nebraska-Lincoln said yesterday that they learned of the discovery in a message from John Clough, project science director. He is at a drilling site about 400 miles from McMurdo station and 300 miles from the edge of the ice.

Mr. Clough said that when a television camera was lowered through a recently drilled hole to the seabed, two fish swam across the field of view.

The hole through which the camera was lowered was drilled by a 25-foot rocket-like torch called a Browning drill. A hole drilled through the shelf Dec. 2 had frozen shut before scientific experiments could be initiated, but it is now being melted open by a heat cable lowered into it before it froze.

Paved With Small Rocks

Mr. Clough said that the camera lowered through the newer hole showed that the seabed was paved with small angular rocks, most less than six inches long.

"On two occasions, a fish swam slowly across the field of view near the bottom," he added. "Also visible on the bottom were signs of life in the form of tracks, trails and burrows."

An international group of scientists working at the project site on the Ross Ice Shelf hopes to trap any specialized form of life beneath the ice. The scientists will also gather samples of sediment and rocks from the bottom.

Mr. Clough estimated that the shelf has covered the area being investigated for at least 120,000 years. No one before has conducted experiments below the ice shelf.

be extracted.

Such cores, formed from snow that has fallen on Antarctica over thousands of years, would provide clues to past climate, volcanic activity and changes in atmospheric constituents.

This time, diesel oil or a mixture of diesel and ethylene glycol will be used in the belief that contaminated ice samples are better than none at all.

Icebreaker Leaves New Zealand

SEATTLE, Dec. 19 (AP)—The trouble-plagued icebreaker Polar Star left Wellington, New Zealand, late last week on the final leg of her trip to the Antarctic, the Coast Guard reported today. The nation's biggest and most powerful icebreaker, commissioned in January 1975, was unable to pursue her duties until late November. An assortment of mechanical problems kept the 399-foot vessel in drydock for more than a year.

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AUGUST HOWARD, Editor

THE POLAR TIMES highly recommends "The Polar Record," published by the Scott Polar Research Institute, Cambridge, England.

The American Polar Society was founded Nov. 29, 1934, to band together all persons interested in polar exploration. Membership dues are $2.00 a year or $5.00 for 3 years, which entitles members to receive THE POLAR TIMES twice a year.

Back issues, No. 1 through No. 77, if available are 50 cents each. Issue 78 and onward are $1.00.

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American couple spend winter on frozen Antarctic sea

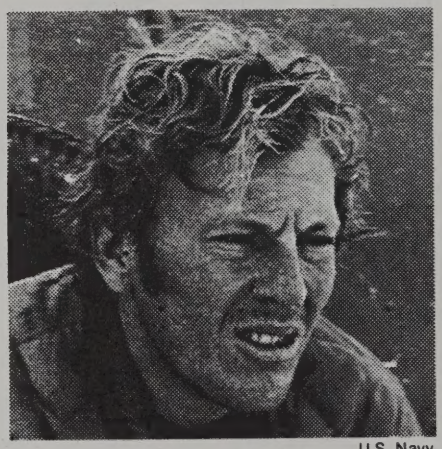
By David F. Salisbury
Staff correspondent of
The Christian Science Monitor

McMurdo Base, Antarctica

John Oliver has spent the Antarctic winter diving in the ice-covered waters off Ross Island while his wife, Donna, assisted him from the surface. The Olivers are the first American couple to spend a winter "on the ice."

John, a Scripps Institution of Oceanography researcher, is an Antarctic veteran and the station science leader at McMurdo. This is Donna's first visit to the ice-bound continent.

To while away the months of darkness, they read quite a bit. She had several needlepoint projects and kept a journal. He learned to knit.



U.S. Navy

John Oliver: learned to knit

But most of their time was devoted to discovering all they could about the creatures that inhabit the bottom of McMurdo Sound.

Filtered by the ice, the Antarctic light creates a vivid blue world. Here scarlet starfish cover the bottom, pastel-colored sea anemones waft their delicate fronds in undersea currents. Tanslucent jellyfish and primitive, big-eyed fish float past. The spicules of a rare variety of sponge form exotic undersea forests Boulders encrusted with ice rise unexpectedly until stopped by the underside of the ice ceiling.

These frigid waters harbor an astonishingly rich marine community.

"The density of living things here is as high as anywhere in the world," John says. There are not many fish, but the bottom dwellers which he studies make up for this lack.

The water is exceptionally clear, better than the Bahamas, the diver says. And with every dive, he sees something new.

"It's exciting to hear what he finds and sees," says Donna, whose job is minding the lines and gear in the heated house over the diving hole.

Their latest discovery was of a delicate-looking marine worm called a polikeet. This "turns on" for a brief period, eats prodigiously, and spider-webs the bottom with its narrow tentacles. "It doesn't feed at any other time," John says. This was the first time that they had seen the bristled worm active.

This year is the first that scientists have studied these Antarctic creatures during the winter.

Swimming in the Antarctic waters is "Not too bad," the diver says, although he admits that the suits could be warmer.

STAUNCH SIBLING

The Polar Record

Our attention has just been drawn to the 'masthead' of our sister journal, *The Polar Times*, which, we were surprised but delighted to learn, carries the announcement: 'The Polar Times highly recommends "The Polar Record", published by the Scott Polar Research Institute, Cambridge, England.'

Curiosity got the better of us and we scuttled off to the bookshelves, where a little research soon revealed that *The Polar Times* has carried that discreet endorsement ever since its first issue, 43 years ago. We lingered over those early issues for a while, and were impressed by the sterling service that the journal has performed over the years in recording for posterity (in addition to the major events) many little known activities in the polar regions and, through its obituaries, the lives of dozens of minor polar explorers of whom we might otherwise now know nothing.

The Polar Times began life as a natural successor to the *Little America Times*, a journal established in 1933 to carry despatches and press bulletins concerning the Byrd and Ellsworth Antarctic expeditions of 1933–35 to friends and relatives of expedition members. On its first appearance in June 1935, under the auspices of the newly founded American Polar Society, *The Polar Times* extended its range to include newspaper and journal articles on activities throughout the polar regions, but retained the newspaper format it had developed as *Little America Times* and which is still one of its main features today.

If you would like to join the American Polar Society (which includes an automatic subscription to *The Polar Times* and, at $2 per year is surely a bargain), then please contact its secretary and editor, August Howard, 98–20 62nd Drive (Apt 7H), Rego Park, New York 11374, USA.

Crustacean Found In Antarctic Water

WASHINGTON, Dec. 20 (UPI)—Scientists have found a crustacean and fossils that may have been hidden for 120,000 years beneath quarter-mile-thick ice in the Antarctic.

A 10-inch hole was drilled through the ancient Ross Ice Shelf last week by an international team of researchers. A television camera and light were lowered, followed by apparatus to sample the water, marine life and the sea bottom.

A dispatch received yesterday at the National Science Foundation, which manages the project, said what appeared earlier to be two fish swimming near the bottom of the frigid, sunless waters may have been crustaceans.

Dr. Duwayne Anderson, chief of polar programs at the foundation, said that sediment samples taken from beneath the sea floor included tiny shelled creatures called foraminifera and possibly some worm tubes.

He said that the samples also included fossilized diatoms, or one-celled plants, that the Antarctic scientists said were of late Miocene age, meaning they are at least 14 million years old.

Antarctic trip open to Scout

One Scout or Explorer from the United States will be chosen competitively to accompany a scientific expedition sponsored by the National Science Foundation and the Readers Digest Association. The selection of a single representative of the Scouts will commemorate the 50th anniversary of Scout Paul Siple's trip to Little America with Commander Richard E. Byrd in 1928.

The Antarctic trip, lasting three months, will begin next fall. Candidates must have at least two year's membership in the Boy Scouts. Preference will be given to candidates holding selected merit badges or who have proven abilities in similar disciplines.

Penguins Coming From Antarctica

SAN DIEGO (AP) — Twenty Emperor penguins will be flown soon to San Diego aboard an Air Force cargo jet from McMurdo Station in Antarctica.

Along with 80 of the smaller Adelie penguins, they are headed for study at the Carl Hubbs-Sea World Research Institute.

The two species are native to the southernmost continent. Emperor penguins are four feet tall and weigh 80 pounds.

The National Science Foundation is sponsoring the project. Inside the C-141 jet from Travis Air Force Base, temperatures will stay below freezing on the 10,000-mile flight, a spokesman said Tuesday. Nov. 27

Antarctic airplanes aid Greenland program

Two U.S. Antarctic Program LC-130 Hercules airplanes were used this northern summer to support remote field operations of the National Science Foundation-sponsored Greenland Ice Sheet Program (GISP).

The two ski-equipped airplanes, flown by U.S. Navy Antarctic Development Squadron Six (VXE-6), were in Greenland on three occasions between early July and mid-August. GISP field parties were transported to and from Camp Century, a new camp called North Central, and a U.S. Air Force installation, DYE-2, on the Greenland Ice Sheet. At DYE-2, the Browning Flame-Jet Drill was successfully tested for use in the antarctic Ross Ice Shelf Project during the coming 1977-1978 field season.

GISP is a 5-year international study of the factors controlling the Greenland Ice Sheet's present and past mass balances, atmospheric processes, and responses to climatic change. GISP field activities are coordinated by the Polar Ice Coring Office, University of Nebraska, Lincoln.

Old South Pole Station sealed

Surface access passages to the original Amundsen-Scott South Pole Station were permanently exposed to drifting snow in early 1977 as a means of sealing off the abandoned facility from further visits.

Built in 1955-1956 for the International Geophysical Year, the old station operated year-round through early January 1975. A replacement facility nearby was dedicated on 9 January 1975 (see March/April 1975 *Antarctic Journal*, pages 37-44).

The original U.S. station at the geographic South Pole became buried over the years under about 15 meters of snow and ice, the crushing weight of which eventually led to the decision to build the new station. After the new station opened, however, the old station was still visited from time to time to collect miscellaneous, small items that might be useful at the new station. Most salvageable items had been removed from the old station at the time of its closing in early January 1975.

Occasional visitors to the old station reported hearing loud cracks, presumably caused by the weight of the snow and ice. Fearing that the strained buildings and tunnels might collapse, National Science Foundation officials declared the old station unsafe and ordered it sealed.

Poland achieves Antarctic Treaty consultative status

Representatives of the 12 Antarctic Treaty signatory nations, gathered in London for a special consultative meeting on 29 July 1977, recognized the consultative status of the Polish Peoples Republic.

Poland, which on 8 June 1961 was the first nation to accede to the Treaty after it was signed by the original 12 nations on 1 December 1959, is also the first acceding party to the Treaty to gain consultative status under Antarctic Treaty Article IX(2). The Antarctic Treaty entered into force on 23 June 1961.

With consultative status, Poland has the right to participate in deliberations, recommendations, and decisions of Antarctic Treaty consultative meetings. The Ninth Consultative Meeting is scheduled for 19 September to 7 October 1977, also in London. Before July's special consultative meeting, the Polish government announced that it had approved all recommendations adopted by the previous eight regular consultative meetings in furtherance of the principles and provisions of the Antarctic Treaty.

Poland has established a new year-round antarctic station, Arctowski (62°10′S. 58°28′W.), on King George Island west of the Antarctic Peninsula. The station began year-round operation last March.

Navy Inherits Polar Waste

UPI Photo

A mound of contaminated dirt and rock left over from an Antarctic nuclear power station awaits shipment to California

McMurdo, Antarctica (UPI)—The U.S. Navy has become the owner of 12,000 tons of radioactive dirt that Washington says is too contaminated for disposal in Antarctica. So the Navy is shipping it 8,000 miles from here to California.

The $1-million operation was ordered because of a State Department interpretation of the 12-nation Antarctic treaty, which bars disposal in Antarctica of "radioactive waste material." An authoritative source said a fear of criticism or public condemnation by the Soviet Union, one of the signatories of the 1959 pact, prompted the decision.

The dirt and crushed rock is being dug from the site of a dismantled, 10-year-old nuclear power plant, which was shut down five years ago when a water leak was discovered in the reactor's cooling system. Authorities say the contaminated soil does not pose a threat. Capt. C.H. Nordhill, commander of the U.S. Naval Support Force in Antarctica, said a person "would have to lie in this dirt 24 hours a day for six months to absorb the same amount of radioactivity he gets from a chest X-ray."

Navy authorities who handle the logistics for McMurdo, which houses a National Science Foundation research station, said 7,908 tons of the contaminated dirt has already been shipped to the Navy base at Port Hueneme, north of Los Angeles. They said that another 4,000 tons, which was dug from a hill near the reactor, has been piled at the edge of the Ross Sea, awaiting the arrival of the cargo ship Bland on its annual Antarctic summer supply run. Since the Navy has only a short time to unload the transport ship, reload it with dirt and get it out of McMurdo before the end of the coming summer season, which is brief, all available personnel must help with the loading.

In Washington, a spokesman said the Navy has not decided on what method will be used to dispose of the contaminated dirt once it gets to California.

Dec. 17

Life in the Antarctic mud

Scientists have discovered two types of tiny marine animals, previously unknown, living in the mud and ooze beneath sea ice in Antarctica. The National Science Foundation says that the 1-to- 2-inch-tall creatures, which resemble miniature trees, were recovered alive by three scientists during an expedition last winter. They were found in subfreezing water 85 to 100 feet deep. The scientists, Drs. Jere Lipps and Ted DeLaca of the University of California at Davis and Robert Hessler of the Scripps Institution of Oceanography at La Jolla, Calif., said that the grayish-brown animals appear to be one-celled organisms of the Foraminifera order. They have not yet been named. Lipps said in a report to the foundation that one tree-like organism lives in the mud in great abundance. The other type has a trunk "with arms that droop down" and is not as abundant. "The animals have no eyes and no mouth," Lipps said. "We think they may feed in one of two ways: They may extend a pseudopod [false foot]—tiny filaments of protoplasm—which capture plants floating by in the water, possibly stirred by other animals swimming by. They also have a rootlike system, which may absorb nutrients from the mud they live in—much like a tree." Lipps said that the animals are too small to be edible for humans, but he said that fish or other animals may eat them.

The creatures were brought to the United States in special cooling containers. They are kept in refrigerators equipped to grow tiny plants on which they feed. The discovery was made in New Harbor, a bay at the foot of Taylor Valley, across McMurdo Sound from McMurdo Station, the main American scientific outpost in Antarctica.

Nov. 10

'Continental drift' theorists case

By JOHN WELTER
Of The Capital Times Staff

Aug. 23

The field of geology has experienced a revolution in recent years, and many of its revolutionaries are meeting in Madison to compare notes this week.

It's a scientific revolution, not a political one, and it centers around the theory of continental drift — whether or not the world's continents were formed by the breaking apart and drifting of the earth's land masses in the past 250 million years or so.

University of Wisconsin geology professor Campbell Craddock considers the book that led to the development of the continental drift theory as significant as Charles Darwin's "Voyage of the Beagle" and "The Origin of Species," which first outlined the theory of evolution in the 1850s.

The Madison campus plays host to the Third International Symposium on Antarctic Geology and Geophysics this week, a meeting of scientists from about 15 nations now doing research in the Antarctic. Of more than 100 papers to be presented, over half are concerned with the way the south polar region fits into the continental drift theory.

During the week you may see bumper stickers on campus that read "Reunite Gondwanaland." They're sort of a geologist's in-joke.

Gondwanaland is a central concept in the theory of continental drift. Prevailing geologic theory holds that the continents and subcontinents of the Southern Hemisphere — South America, Africa, Australia, Antarctica and India — were once joined together in the supercontinent of Gondwanaland. The northern continents formed another supercontinent, Laurasia, they think.

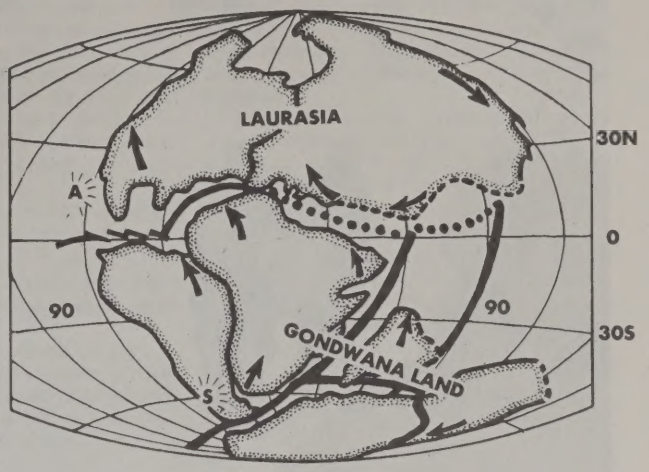
The continents, resting on "plates" of the earth's crust, were forced apart at faults as superheated liquid rock was pushed up from the earth's core, according to the theory, which suggests the movement still goes on mainly at mid-ocean ridges.

Continental drift was first suggested in the 1930s by South African Alex DuToit, who drew rough maps of Gondwanaland from evidence he found by comparing rock formations in South American and Africa.

"That was one of the greatest things the human mind ever produced," Craddock said. **"He drew maps of Gondwanaland we can hardly improve on today. Everyone laughed at DuToit, but he was right . . . He glued it all back together, and said, 'If I'm right, you'll find evidence of it in Antarctica.' "**

Du Toit's theory lacked physical evidence until 1958, when a team of geologists found glacial evidence in Antarctica that he had predicted.

When Craddock was a graduate student in the early '50s, he said, "it would have been crazy to talk about continental drift." And it remained unaccepted by many geologists until about a half-dozen years ago, when other evidence began to mount. About 1970 a team found the fossilized jawbone of an amphibian similar to an extinct African species, and the following year a group of paleontologists excitedly reported they had found an old stream channel "with bones falling out of it," Craddock said.



Divergent boundaries
Convergent boundaries

At this week's conference many Antarctic geologists will present papers on new supporting evidence: fossils in various areas of Antarctica that match others from South America, South Africa and Australia; rock formations in East Antarctica that correlate with others in India and Sri Lanka.

Scientists — some of them working with or supported by oil or mining companies — are now studying mineral resources in the Antarctic, and a handful of papers on that subject will also be presented this week. The topic is now a hot one in the field (if any could be described as "hot"), although Craddock said "no proven mineral deposits of workable value have been found yet."

One team searched for diatomaceous fossil deposits that could indicate oil; another surveyed an area looking for evidence of uranium.

10 Survive Being Lost in Antarctic

McMurdo, Antarctica
Dec. 10 (UPI)

Ten people aboard two helicopters survived forced landings on Antarctica's frozen Ross sea and returned safely to the American base at McMurdo.

None of the ten suffered any injury despite more than three days of hurricane-force winds and 20-below-zero temperatures.

A sudden storm forced the two helicopters down some 45 miles from McMurdo Saturday while they were on resupply missions in the Antarctic interior.

The helicopters were piloted by Lieutenant Sam Feola of Camarillo, Calif., and a Lieutenant Brown of Morehead City, N.C.

The seven aboard Feloa's helicopter found refuge in a hut at Marble point, but Brown, with co-pilot Ken Mathews of Auckland, New Zealand, and crew chief Rod Law of Knoxville, Tenn., were forced down on the sea ice and spent the next three days huddled in sleeping bags while 90 m.p.h. winds drove snow that eventually engulfed their craft.

"The sky cleared for about half an hour Saturday night, showing we were less than a mile from the edge of the ice pack, which was crumbling fast under the high winds," Brown said.

Brown, a three-year Antarctic veteran, said they could not tie the bright orange helicopter down because they had landed on glare ice and only the fact that the wheel froze to the ice saved them from being overturned or blown into the ice-filled sea.

"We had no radio communication and knew it would be impossible to launch any search for us until the storm ended," Brown said. "All we could do was wait and pray, and I will have to spend lots of time in church to keep the promises I made to God out there on the ice."

Feola jammed his passengers into the hut where they settled in for what was to be a three-day wait. Feola had radio communications with the New Zealand base, but Brown, Mathews and Law were on their own on the edge of the ice pack, living off emergency rations and huddled in an unheated plane for 80 hours until the storm broke Tuesday afternoon.

It took Feola's crew three hours to dig out their plane and Brown's people finally got the snow cleared after a similar snow-shoveling job.

"The happiest moment I'll ever have is when we hooked up the battery and it showed 23 volts despite those three days and nights of sub-zero temperatures. And the sweetest sound was when the engine caught and we knew we were going to be able to fly home," Brown said.

The planes landed at McMurdo within minutes of each other Tuesday. They now share the record of being "lost" longer than any other aircraft in Antarctica without injury or loss of life.

Penguins on Ross Sea, Antarctica

By R. Norman Matheny, staff photographer

Emperors of the Antarctic, disdainful while powers go slow on region's resources Christian Science Monitor

Sharing Antarctica's riches

13 nations try to work out ways to prevent exploitation of continental waters

By Alexander MacLeod

The Christian Science Monitor

London

Thirteen countries with direct interests in Antarctica have decided to work out programs for the exploitation of mineral and protein resources in and under the region's icy waters.

But after three weeks of talks here they have agreed to move cautiously and to give maximum attention to calls that the Antarctic environment be safeguarded.

Signatories to the 1959 Antarctic treaty decided to produce a set of interim guidelines for catching krill, a shrimplike creature rich in protein and found abundantly in Antarctic waters, while detailed work on long-term fishing arrangements are worked out. They also agreed on the need to conduct prolonged scientific and ecological surveys before any attempt is made to unlock the vast properties of oil, natural gas, and other valuable minerals thought to lie beneath the south polar ice cap.

The countries involved in the talks were Argentina, Australia, Belgium, Britain, Chile, France, Japan, New Zealand, Norway, South Africa, the Soviet Union, the United States, and Poland. All have territorial or scientific interests in the region and want to protect it against overexploitation.

50-million-ton harvest

The stakes involved in Antarctica are staggeringly high. British experts have calculated that 50 million tons of krill a year could be harvested without threatening existing stocks. This compares with the 60 million tons of all kinds of fish caught annually around the world.

Estimates of the amount of oil in the area of the Antarctic shelf vary, but one U.S. document circulated at the conference spoke of recoverable deposits of "tens of millions of barrels." Some experts say the region may contain as much oil and gas as the entire Alaska field.

The thought that oil and gas exist in Antarctica is based not on test drillings but on geological surveys and estimates. But most of the large oil companies think the potential is great. They also know, however, that new techniques must be developed before test drillings can occur.

From a treaty powers' standpoint, this is welcome. For it gives them a space of 10 to 15 years to frame regulations for prospecting companies.

Time runs short

In the case of krill, time is much shorter. Soviet trawlers already are harvesting krill in increasing quantities, and as pressure builds up on world food resources more countries are expected to become actively interested in the harvest.

The London conference has called for temporary guidelines to be set for krill fishing, and these are expected to fall well within safe limits.

An important complication in the efforts of the treaty powers to combine exploitation of the region with concern for the environment is that overenthusiastic oil drilling could endanger future krill supplies. Petroleum spillage will be an everpresent danger, and steps must be taken to ensure that it does not occur.

Political tensions within the 13-nation group and between treaty and nontreaty countries also are a source of concern. The Soviet Union, enjoying major oil reserves of its own, is unenthusiastic about oil drilling in Antartica but wanted to open the door much wider to krill fishing. Non-Communist states are much more interested in the oil and can be expected to resist Soviet attempts to limit progress in this area.

Others seek share

Meanwhile, third-world countries not fortunate enough to enjoy territorial rights in Antartica have been stepping up the pressure at the United Nations to be granted a future share in the riches of the region. The London conference had representations from the UN Food and Agriculture Organization, which insists that the resources of Antarctica should be developed mainly for the benefit of poor countries.

Conference officials say the main achievement of the London talks was to preserve a reasonable amount of agreement among the treaty powers and to underscore one of the leading ingredients of the treaty itself – a principle that the region must not fall victim to uncontrolled exploitation. But it also was strongly felt in conference circles that the task of conserving Antarctic resources for future generations is only just beginning. Officials say 1978 will be a busy year for them as work proceeds on guidelines for future food and mineral development.

Bubbles in Antarctic ice: that's clean air!

By Reuter

Canberra

Australian research scientists are hoping some ancient bubbles will help them discover what the atmosphere was like before the age of industrial pollution. The tiny air bubbles are trapped in Antarctic ice that is tens of thousands of years old.

The ice cores have been brought from the Antarctic by the Australian Department of Science. They have been catalogued according to age and are being stored in deep freezers pending analysis by Commonwealth Scientific and Industrial Research Organization (CSIRO) scientists at Melbourne.

The scientists are also studying carbon deposits in the "age rings" of trees to determine if carbon dioxide levels in the atmosphere have changed significantly over the centuries.

They are looking to the bubbles and trees to help them establish:

- Where carbon dioxide moves in the atmosphere
- Whether the volume of carbon dioxide is likely to change
- Whether carbon dioxide movements and concentration changes modify climate.

The Australian scientists think the gas helps shape the world's climate by acting like a greenhouse – letting sunlight pass through but trapping heat near the ground. To assess the great volume of carbon dioxide created in modern times by burning coal and petroleum, they have been monitoring modern gas levels since 1972.

Special air-sampling devices have been installed in one international and three domestic airliners.

Australia was the second country, after Sweden, to establish airborne carbon dioxide measuring programs.

The Swedish and Australian tests are part of a global monitoring program involving ground stations at the South Pole, Alaska, Hawaii, and Wellington, New Zealand. A fifth ground station is being built in Western Samoa.

Ice cap could melt

The scientists claim that under certain circumstances involving high carbon dioxide concentrations the earth's temperature could increase and lead to melting of the ice caps. However, the CSIRD research team thinks such a prospect is a long way off.

"The average carbon dioxide level in the atmosphere is about 330 parts per million," according to one of the researchers, Dr. Graeme Pearman.

"We've found that gas levels are building up at a rate of about one part per million per year and, as far as we can estimate at present, by the year 2000 the earth's temperature may rise by one half of one degree C. as a result."

Dr. Pearman continued: "During the Northern Hemisphere's summer the European and North American forests draw huge amounts of carbon dioxide from the air as they grow. Then, as the trees lose their leaves and photosynthesis ceases, large quantities of the gas are poured back into the air."

Dr. Pearman said that this gas seemed to travel southward over the equator at an altitude of between five and six miles, taking about five months to complete the journey into southern latitudes.

"It would appear that this natural inflow balances itself, but the inputs from industrial sources do not, and we have a gas level which increases from year to year," he said.

1977-1978 U.S. Antarctic Program under way

Early this month, U.S. Navy Antarctic Development Squadron Six (VXE-6) completed a series of turnaround "winfly" (winter fly-in) LC-130 flights to McMurdo Station from Christchurch, New Zealand. Science and support personnel, plus cargo of various kinds (mail, fresh foods, etc.), were delivered for a traditional head start on the 1977-1978 U.S. Antarctic Program field season.

Meanwhile, the bulk of 1977-1978 investigators and some support personnel gathered at Reston, Virginia, 18-21 September for the annual U.S. Antarctic Program Orientation Conference. Sessions included training in various aspects of coldweather work and survival, information on how to prepare shipments of science cargo and specimens, and general familiarization with the research being conducted by other disciplines in Antarctica.

Full-scale 1977-1978 U.S. operations in Antarctica begin at McMurdo in early October, followed by the season's first flights to Amundsen-Scott South Pole and Siple stations by early November. R/V *Hero* is expected to dock at Palmer Station, on Anvers Island off the Antarctic Peninsula, for the first time this season in early December.

Over 325 U.S.-sponsored investigators will fan out over the antarctic continent and surrounding seas this season to conduct some 90 projects in biology, biomedicine, earth sciences, glaciology, meterology, upper-atmosphere physics, and oceanography. Highlights include an extensive surface reconnaissance of Marie Byrd Land's Bakutis and Hobbs coastal areas, a renewed effort to drill through the floating Ross Ice Shelf to study the sub-shelf environment—including any life that may be discovered there—for the first time, and several basic studies of Antarctica's living and mineral resources.

In addition to direct support of these science projects, which uses most of the time and assets available to U.S. Antarctic Program logistics support units, nearly 350,000 kilograms of construction cargo will be airlifted from McMurdo to Siple Station this austral summer in preparation for the construction this season and next of a replacement for the present station, now completely buried under crushing snow.

The cargo arrived at McMurdo by ship last season.

ANTARCTIC JOURNAL
September 1977

HARD, COMPACT SNOW IS CUT INTO BLOCKS
BLOCKS ARE FITTED TOGHETHER IN A CIRCLE AND TRIMMED TO FORM A SLANTING DOME
INSIDE, RAISED SNOW PLATFORMS COVERED WITH FURS SERVE AS EATING AND SLEEPING PLACES
TUNNEL ENTRANCE
Simonsen

The most well-known of the Eskimo igloos, the snowhouse of the central Canadian Eskimos, is constructed in the following way: Hard, compact snow is first cut into blocks measuring about 3 feet long, 2 feet high and 8 inches thick. To cut the snow, a short, sword-like knife made of ivory is used. The blocks are then fitted together in a circle and trimmed to form a slanting dome. A small hole cut in the top lets in fresh air and lets out smoke if a fire is lit inside. The tunnel entrance is built of one or more domes and is designed to trap the cold air.

A thin slab of ice or sewn gut is placed in the wall for a window. Inside, shelves for utensils are cut in the walls. Raised snow platforms, covered with furs, serve as eating and sleeping places.

A large winter snowhouse for a family measures about 15 feet wide and 12 feet high. Small, temporary snowhouses used by travelers are of the same form but measure only 7 feet wide and 5 feet high.

Eskimos who live in snowhouses abandon them in the spring and move into tents made of skins. Today, prefabricated houses are gradually replacing snowhouses as well as the sod and tent Eskimo igloos.

Antarctic ideal laboratory

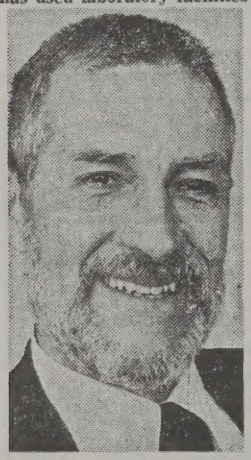
Oct. 17

Research in the Antarctic by an American doctor may ultimately lead to control of the common cold.

Dr Elliot C. Dick, professor of preventive medicine at the University of Wisconsin medical school, is working on the premise that colds are more difficult to transmit than earlier thought.

Dr Dick, in Christchurch today at the end of his third winter season on the ice, is now to start immediately on devising a way of interrupting the cold and other respiratory diseases.

The study — the only one of its kind in the world — has used laboratory facilities



Dr Dick

at Christchurch Hospital.

Research on transmission of cold viruses is being carried out during the five-week isolation period between the winter fly-in and the beginning of the main field season this month.

This period was considered ideal for following the movement of common cold viruses through the closed population.

Dispelling some myths about the common cold, Dr Dick said:

- It was caused by at least 150 different viruses, ranging from those causing the common cold, to a lethal pneumonia.
- Antibiotics were unsuccessful in treatment of the cold viruses.
- Because there were so many varieties of viruses, a vaccine could not be produced.

"So the conventional methods are not going to work on combatting the common cold," he said. "Interruption would appear to be the only solution."

Research would not have been possible in, for instance, the open, moving population here, where the source of the viruses could not be traced.

While the main study had centred on McMurdo Station, a sub-study was conducted at Scott Base this year.

"All the material we have found thus far, seems to confirm our results in human volunteers in Madison (Wisconsin), that colds are much more difficult to transmit than we might have expected.

"Of course, this is very good news."

This year, for example, in the Scott Base sub-study the research team found two people who arrived with colds. Their viruses were isolated.

None of their colleagues in the confined community developed colds, in spite of their close proximity to each other.

Furthermore, the men at Scott Base were closely involved with many Americans at McMurdo Station where colds were evident.

"During the winter fly-in period of five weeks, not one single person at Scott Base got a cold," Dr Dick said.

However, final analysis lay with laboratory serum tests which would determine whether others were infected.

In an open population study of virus transmission in Wisconsin, Dr Dick found the viruses did not transmit easily, even to room-mates.

In a later study, volunteers were exposed to cold viruses. Exposure was prolonged and in physically close situations such as in marraige. The transmission rate was only 38 per cent, and then only by those with severe colds.

So in about two-thirds of cases, there was no transmission.

"We have enough data from the past two years in the Antarctic, combined with previous studies, to tell whether our thesis is going to be proved or disproved," Dr Dick said.

"Thus far, it looks good."

Dr Dick will return to Christchurch in two years.

Polar Star greets Antarctica

SEATTLE (AP)—The world's largest and most powerful icebreaker, Polar Star, made its debut over the Christmas weekend, breaking ice in McMurdo Channel in Antarctica, the Coast Guard reported here

Coast Guard spokesman Mike Kelley said the Polar Star, plagued with numerous mechanical problems which kept it drydocked for the first year of its life, had no problems on its first test assignment.

"The ship used her diesel engines and gas turbines to ram through 3 to 8 feet of ice," Kelley said.

He said the Polar Star was scheduled to begin Friday forging a path to McMurdo Station, west of the Ross Ice Shelf, the largest solid ice shelf in Antarctica.

NSF

Edward P. Todd

New director of polar programs named

In mid-August 1977, Edward P. Todd was appointed director of the National Science Foundation's (NSF) Division of Polar Programs (DPP) by Foundation Director Richard C. Atkinson.

The position had been left vacant by the 15 July resignation of Robert H. Rutford, DPP director since April 1975, to become vice chancellor for research and graduate studies at the University of Nebraska, Lincoln.

Dr. Todd has been on the Foundation staff in various capacities, including several senior posts, since 1963. He will continue to serve as acting assistant NSF director for astronomical, atmospheric, earth, and ocean sciences—the directorate of which DPP is a part—until President Carter names a successor to Robert E. Hughes, who stepped down from the post last December to return to Cornell University. Dr. Todd had been Dr. Hughes' deputy since August 1975.

A native of Newburyport, Massachusetts, Dr. Todd received the B.S. in physics in 1942 from Massachusetts Institute of Technology and the Ph.D., also in physics, in 1954 from the University of Colorado. Following two periods of industrial research employment, he was a research associate and technical director of the University of Colorado's Laboratory for Atmospheric and Space Physics from 1957 to 1963. In 1971 he received the NSF Distinguished Service Medal as deputy assistant director for research.

Antarctica To Get Its First Native

BUENOS AIRES, Nov. 4 (Reuters)

Expectant mother Maria Silvia de Palma set sail yesterday for the Antarctic, where she is to give birth to the first native-born Antarctican in January.

Mrs. de Palma, wife of the garrison chief of Argentina's Esperanza (Hope) Antarctic base, Captain Jorge de Palma, left aboard the navy vessel Bahia Aguirre with the wives of other military personnel and 13 children, aged three months to 13 years. Also aboard were two teachers to set up a school for the children during their parents' yearlong tour there.

Two doctors from Ushuaia in Tierra del Fuego, the southernmost city in the world, will aid the resident doctor in Esperanza at the birth.

AAAS national meeting includes polar symposium

"Polar research: to the present, and the future" was the title of a day-long symposium held as part of the 143rd annual meeting of the American Association for the Advancement of Science (AAAS) in Denver, Colorado, on 20-25 February 1977.

Mary Alice McWhinnie, De Paul University, arranged the session. The 11 papers given discussed the emergence of Antarctica (Laurence M. Gould, University of Arizona), polar research—a synthesis (George A. Llano, National Science Foundation), Antarctica and Gondwanaland (Campbell Craddock, University of Wisconsin), glaciology and glacial history (Richard L. Cameron, National Science Foundation, and George H. Denton, University of Maine), the polar role in global climate change (Joseph O. Fletcher and John J. Kelley, National Oceanic and Atmospheric Administration), oceanography (Theodore D. Foster, University of California), southern-ocean productivity (Sayed Z. El-Sayed, Texas A&M University), marine mammals (Donald B. Siniff, University of Minnesota, Ian G. Stirling, Canadian Wildlife Service, and L. Lee Eberhardt, Pacific North-West Laboratories), physiology and biochemistry of marine ectotherms (Arthur L. DeVries, University of Illinois), terrestrial adaptations (Bruce C. Parker, Virginia Polytechnic Institute and State University), and conservation, resources, and international perspectives (Robert H. Rutford, National Science Foundation).

AAAS will publish a proceedings of the session in late 1977.

Third DVDP seminar announced

A third seminar on scientific results of the Dry Valley Drilling Project (DVDP) has been announced for 5-11 June 1978 in Tokyo, Japan. The sessions will be convened by Takesi Nagata of the Japan National Institute of Polar Research.

U.S. Navy

Present and former U.S.-U.S.S.R. antarctic exchange scientists at the Soviet Union's Vostok Station (78°28'S. 106°48'E.) on 28 December 1976, the day that Michael F. Fancher (second from left), Stanford University, arrived to winter there with the 22nd Soviet Antarctic Expedition. The group was flown to Vostok aboard a U.S. LC-130 Hercules (background) from the United States' McMurdo Station, about 1,260 kilometers distant. Others (left to right): Ralph N. Johnson, U.S. Geological Survey (wintered at Vostok in 1976); Robert B. Flint, Jr., Stanford University (wintered at Vostok in 1974); A.N. Zaitzev, Institute of Terrestrial Magnetism and Ionosphere and Radio-Wave Propagation (wintering at the United States' Amundsen-Scott South Pole Station in 1977); Edward P. Lysakov, Arctic and Antarctic Research Institute (wintered at McMurdo in 1976). The Soviet Union and the United States have exchanged scientists in the Antarctic yearly since the 1957-1958 International Geophysical Year.

DVDP retrieved core and other geological specimens from 15 drillholes in the McMurdo Sound region from 1972-1973 to 1975-1976. A cooperative venture of Japan, New Zealand, and the United States, DVDP preliminary results have been presented at two previous seminars in Seattle, Washington (May 1974), and in Wellington, New Zealand (January 1976).

Symposia set on ice masses, glacier beds

The International Glaciological Society will hold a symposium on the dynamics of large ice masses at Ottawa, Ontario, Canada, 21-25 August 1978. The symposium will concern the dynamics of ice sheets past and present, ice caps, large valley glaciers, and floating ice.

A papers committee will consider any paper that provides new information on these topics. For information write: Secretary, International Glaciological Society, Lensfield Road, Cambridge CB2 1ER, England.

Also at Ottawa, and during the previous week, the National Research Council of Canada, Subcommittee on Glaciers, will hold a symposium on "glacier beds: the ice-rock interface." Write: C.S.L. Ommanney, Glaciology Division, Environment Canada, Ottawa, Ontario, Canada K1A OE7.

Proceedings of both symposia will be published in special issues of the *Journal of Glaciology*.

Oil Flows With Few Hitches

FAIRBANKS (AP) — After a shaky start, the trans-Alaska oil pipeline is delivering Prudhoe Bay crude to the marine terminal at Valdez with seldom a hitch in the flow of liquid energy.

Tankers large and small are churning through Valdez Narrows toward refineries in the Lower 48 at the rate of about one a day.

As of Nov. 1, more than 68,750,000 barrels of the estimated 9.6 billion barrels of recoverable crude at Prudhoe Bay on Alaska's North Slope had been pumped into the loading tanks at Valdez.

With 4½ months of pipeline operation on the record, President William J. Darch of the Alyeska Pipeline Service Co. says the integrity of the line and the standards of construction have been demonstrated satisfactorily.

Alyeska is the consortium of eight oil companies which designed and built the 800-mile, $7.7 billion line, and now is operating the long steel tube.

"Obviously, the extremely sophisticated system has not been yet completely debugged," Darch said, alluding to minor problems which still crop up.

"The combination of the extremely sensitive and sophisticated instrumentation, with the problems of Alaskan geography, means that we are learning still, and probably shall continue to do so for some time."

Noting that the 100th tanker is scheduled to sail from Valdez with cargo tanks filled with Alaskan oil this month, Darch said it is a signal to Alyeska "that in the language of today we've gotten our act together."

Problems plagued the largest private construction project in history after the first oil entered the 48-inch line at Prudhoe Bay on June 20.

There were spills and accidents that kept pipeline engineers on the hop for more than a month, until the first North Slope crude started spurting in the tanks at Valdez on July 28.

The worst was an explosion and fire which leveled the pump house at Pump Station 8 just southeast of Fairbanks on July 8. One man died in the disaster, and reconstruction work on Pump 8 is still going on, with completion scheduled in January.

Alyeska estimates that it will take about a month after that for systems checking at the station, and that Pump 8 will go back on the line sometime in March.

Alyeska originally had planned to be running about 1.2 million barrels of crude a day through the line by this time, but the Pump 8 disaster intervened.

The daily flow rate on Oct. 31 was 754,000 barrels, but the flow rate varies from day to day. On Oct. 28, for instance, it was 695,000 barrels, on Oct. 26 730,000 barrels.

The daily average flow rate from oil-in on June 20 through Nov. 1 was 509,444 barrels.

"It depends on what goes on in the field, at Prudhoe, and it depends on what goes on in our own operation," Alyeska spokesman Sam Akin said of the daily flow rate.

"We may close down a pump at one of the stations for a few hours for some reason or another, and that will slow down the rate. There are all kinds of things that can affect it. It bicycles from one day to the next.

"We expect that it will hang around the 750,000-barrel figure until Pump 8 goes back on line.

"We will have the capacity then for the 1.2 million barrels a day we were originally to have had by now, but the amount to be moved depends on what the owners want moved.

"If they have a need for that much crude oil someplace, they'll brings ships in to Valdez to move it. If not, we'll be moving at lower quantities."

Coast Guard figures show that 90 tankers laden with North Slope crude had cleared Valdez through Nov. 1, with most destined for refineries in the Seattle, San Francisco and Los Angeles areas.

The others took their cargo through the Panama Canal to refining facilities on the East Coast, or transferred the crude to smaller tankers which could transit the canal.

The first tanker out of Valdez was the 120,000-ton Arco Juneau. It left on Aug. 1 with 824,803 barrels of Alaska crude for the Atlantic Richfield refinery at Cherry Point, Wash.

Akin says there have been minor hitches on the line since the period of major problems in the month after start-up, but he likens them to "taking your new car back to the dealer to fix the bugs."

Akin says the trans-Alaska pipeline started out with an automatic handicap that magnified every problem or accident.

"Pipelines everywhere else in the world are started up with water," Akin said. "They actually fill the lines with water and pump it from Point A to Point Z at the other end until they are satisfied everything is right.

"We couldn't do that up here. With the low pipe temperatures, we'd have had a whole lot of frozen water. We had to do our testing with oil." Nov. 8

Hungary traces the history of airships on a series of seven stamps and a souvenir sheet introduced on Nov. 1,

Roald Amundsen (1872-1928) and his airship "Norge" over the North Pole are pictured on the 3ft stamp,

Greenland Bid By U.S. Bared

COPENHAGEN, Denmark, Aug. 27 (AP) — The historian to the Danish royal court says in a new book that his government turned down a bid by the United States in 1946 to buy Greenland.

Prof. Tage Kaarsted based his 600-page history of Danish political affairs during the period between 1929 and 1953 on public records and hitherto secret government files.

Kaarsted said in an pre-publication interview that the U.S. Secretary of State James F. Byrnes made the offer to Danish Foreign Minister Gustav Rasmussen during a United Nations meeting in New York in 1946, telling him that Greenland was nothing but a huge lump of ice that happened to be of great strategic importance to the United States but could only be a burden to Denmark.

The Danish government never seriously considered the offer, Kaarsted said. But he says Byrnes was serious in making it.

Geologists Discover Uranium In Samples

JUNEAU (AP) — Government geologists have found "significant concentrations" of uranium in sediment samples from a series of springs and streams about 50 miles northeast of Fairbanks, U.S. Bureau of Mines officials said here yesterday.

John Mulligan of the bureau's field operatpons center here said the samples came from within a 20 square mile area near Mount Prindle and the headwaters of Little Champion Creek.

The area falls within the Carter administration's proposed Beaver Creek National Wild and Scenic River designation. But under the administration proposal, mining could be allowed in the area.

The uranium concentrations were discovered during a Bureau of Land Management study of the region conduct as part of an effort to assess the mineral potential of land proposed for withdrawal under various D2 land recommendations.

A report on the discovery said up to 400 parts per million of uranium were found in stream sediments and up to 570 parts per million in spring sediments in the area.

But Mulligan stressed that the source of the uranium has not yet been located and warned that it "may or may not" prove to be a commercially workable deposit.

Mulligan said the bureau was making a formal announcement on the find because of its potential significance and in an effort to make the public at large aware of the discovery as opposed to a select few firms which read bureau technical reports. Sept. 22

U.S. To Increase Pet 4 Exploration

FAIRBANKS (AP) — The U.S. Geological Survey plans to increase petroleum exploration in National Petroleum Reserve 4 on the North Slope.

Under the program proposed for the 1977-1978 winter season, four medium depth oil wells will be completed, two deep oil wells will be started and three shallow gas wells will be drilled near Barrow.

The geological survey also said it plans to prepare drill pads for two more medium depth oil wells to be drilled in the fall of 1978.

Last winter, four exploratory oil and gas wells were drilled on the reserve, but none encountered gas or oil in commercial quantities. July 27

Widow Wins $30,000 In Guess on Oil Flow

ANCHORAGE, July 29 (UPI)—An unemployed Anchorage widow who walks with the aid of crutches won $30,000 today by submitting the closest guess as to how long it would take the first oil to flow from Prudhoe Bay to Valdez.

Jean Mahoney, 53 years old, said she had a "lucky hunch" and missed the official time — 38 days, 12 hours and 56 minutes — by just one minute. The contest was sponsored by St. Patrick's Roman Catholic Parish to raise money for its buildjng fund. The church made $35,000 in the winner-take-all Pipeline Classic.

Dangers hiding glacier wealth

MOSCOW, Idaho (AP)—Alaska's glaciers may cover valuable ore bodies and hold large reservoirs of water that could be piped to cities, University of Idaho researchers say.

But geologists who participate in the university's Juneau Ice Field Research Program Summer Institute say they worry about crevasses and unpredictable weather when they live on the huge masses of ice.

After 31 years, institute participants from UI and other schools are still making discoveries, said UI College of Mines Dean Maynard Miller.

In mapping and probing the interconnected group of glaciers that share a large flat plateau on the Juneau Ice Field, large reservoirs of water have been found in icy cavities, Miller said.

"If the ice trapping the water burst there can be flooding, but this could also be tapped as a source for municipal water supply," Miller said.

Some of the 85 persons working on the ice field last summer worked with instruments to locate ore bodies under the glaciers. They found nickle and other magnetic ore bodies, Miller said.

Another project involves measuring the amount of the insecticide DDT which has accumulated in the ice.

Grant Meyer was one of the seven UI students who lived on the ice field last summer. One of his jobs was to place dozens of poly-vinyl stakes in the ice field to measure glacial movements.

"Your basic impression is that the ice field is a flat desert with sharp peaks sticking up. The only vegetation is lichens," said Meyer, a senior geology major from Idaho Falls.

"Walking on bare ice is actually like walking on pavement. Air bubbles and dirt make the ice rough so it's really easy walking," he said. Nov. 7

Eskimos Angry at Quota Put on Bowhead Whales

TOKYO, Dec. 7 (AP)—The International Trading Commission decided today to limit Alaskan Eskimos to a total catch of 12 bowhead whales for 1978. Eskimo leaders immediately warned that their hungry people would be forced to break a quota that small.

Eleven nations, including the United States, voted for the quota at a special session. Canada, Australia and the Netherlands voted against, and Iceland abstained.

The body ordered that "hunting shall stop when 18 whales have been struck [with a harpoon] or 12 landed." The bowhead is an endangered species.

"This implies that we can have only half of our Eskimos' nutritional needs," said Billy Neakok of North Slope Borough in Alaska.

Mayor Eben Hopson rushed angrily out of the conference, but issued this statement later: "A violation of the quota will certainly take place if no one action is taken by the United States. We call upon the government of the United States to reject the unjustified action by withdrawing, from the commission.

In an interview, the mayor said: "We were willing to accept an 18-bowhead whale quota as the real bottom line, although it still is inadequate for our nutritional needs. We caught 48 of them two years ago, and 29 last year, due to bad weather."

The quota was a compromise measure. The commission had voted in June to ban the killing of bowheads, but relented when the U.S. government asked instead for a quota.

The special session decided yesterday to raise the 1978 sperm whale quota in the North Pacific, traditional whaling ground for the Japanese and Soviet fleets, to 6,444 from 763.

Ice Study Opens Door For Arctic Operations

SEATTLE (AP) — Scientists who spent 14 months on an Arctic ice pack have completed a $20 million study that could simplify shipping supplies to the oil fields of Alaska's North Slope.

The seven-year Arctic Ice Dynamics Joint Experiment (Aidjex) has opened doors to accurate forecasts of the kind of ice conditions that held up a multi-million dollar sealift to Prudhoe Bay in 1975, says Dr. Max Coon, principal study investigator.

Coon said the aim of the joint Canada-United States study was to find a way for shippers to "know what the ice is doing."

Coordinated by the University of Washington's division of marine resources, the project included the most comprehensive Arctic research expedition in U.S. history, said Dr. Norbert Untersteiner, University of Washington professor and study coordinator.

The money came from the National Science Foundation and the Office of Naval Research.

The final Aidjex report was presented at the Symposium on Sea Ice Processes and Models at the University of Washington this week.

Preliminary work began in 1970. Then in March 1975 the scientists set up four ice camps consisting of plywood huts that were flown in and constructed on the spot.

Twenty electronic buoys were placed within a 300-mile radius of the main ice camp to beam atmospheric pressure, temperature and position data.

The ice-bound scientists "had long work schedules and little entertainment," said Coon. Scientists from 10 universities, research institutes and government agencies spelled each other every few months. Sept. 9

Canada and U.S. Sign Accord to Build Gas Pipeline

By ROBERT TRUMBULL
The New York Times

OTTAWA, Sept. 20—Canada and the United States formally signed the agreement today to construct a multibillion dollar pipeline to carry Alaskan natural gas through Canada to American users, and possibly to transport Canadian gas to consumers in southern Canada at a later stage.

Signing the document were Secretary of Energy James R. Schlesinger for the United States and the Deputy Prime Minister Allan J. MacEachen for Canada. The two men had headed the negotiating teams for their respective countries in drawing up the complex agreement.

"It is clearly evident that by working together on this gigantic undertaking, both nations can derive benefits far outweighing those that either country could obtain by proceeding on its own," Mr. MacEachen told Canadian and American onlookers at the ceremony in the Foreign Office.

Those present included Prime Minister Pierre Elliott Trudeau and Senator Mike Gravel, Democrat of Alaska. Senator Gravel had been a vigorous proponent of a pipeline along an all American route through Alaska as an alternative to the two nation project. The Alaskan route was passed over, as were several proposals for all Canadian routes, in favor of the joint project for economic and environmental reasons.

The pipeline will go from Prudhoe Bay, Alaska, southward along the Alaska highway through the southern Yukon and Alberta in Canada. Covering 3,594 miles, its cost is currently estimated at $9.6 billion, but Mr. Schlesinger has estimated that overruns might raise the price to $13 billion or $14 billion. Some Canadian authorities consider Mr. Schlesinger's figures overly pessimistic.

A spur may be added later to take gas from the Mackenzie River Delta and the Beaufort Sea in Arctic Canada to customers in the south, should the northern Canadian reserve prove rich enough to justify the expense. Meanwhile, the so-called Alaska Highway Line, named for the road that it will follow for part of its route, will serve the American Middle West from the copious Alaskan supply.

"Over the long term," Mr. MacKechan said, "this pipeline system will, of course, up one of the cheapest new sources of energy available to both countries and provide a strong inducement to intensified exploration and development of new petroleum reserves in Alaska and the western Arctic region of Canada."

The line, expected to be finished by 1981, will be built by a consortium of three companies, two Canadian and one American. They are the Alberta Gas Trunk Line Company of Calgary, Alberta, the Western Transmission Company of Vancouver, British Columbia, and the Northwest Pipeline Corporation of Salt Lake City.

Soviet Denies Arctic Ice Station Is Designed for Military Purposes

MOSCOW, July 19 (Reuters)—The Soviet press agency Tass today poured scorn on reports that an ice station carrying Soviet personnel off the Canadian coast was being used for military purposes.

The Tass commentary, which singled out a Reuters report last month, said the station, North Pole 22, was not a "roaming Soviet task force" but a drifting scientific station.

"It would be very easy to find out in Canada what is really happening at the Soviet drifting station North Pole 22 by simply asking Canadian scientists who are taking part in studies of the Arctic," the press agency said. "They know exactly that the Soviet research laboratory is engaged not in mythical military experiments but in very peaceful pursuits—studies of the interaction between ocean and atmosphere."

Construction of Alcan Approved by Carter

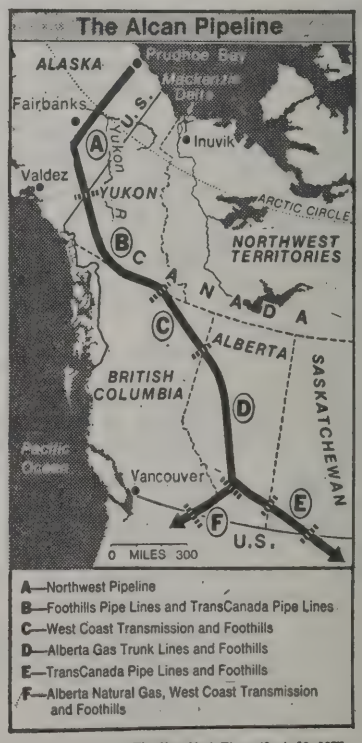
WASHINGTON, Nov. 8 (UPI)—President Carter today gave final United States approval for construction of a 4,700-mile pipeline to carry Alaskan natural gas through Canada to the lower 48 states.

Mr. Carter, who personally selected the joint United States-Canadian pipeline route, called Alcan, signed a resolution of approval passed by the Senate and House last week. The project, to be privately financed, will cost at least $10 billion and is to be completed by 1983.

At the flow for which the pipeline is designed, it would supply approximately 5 percent of the United States market.

The line would parallel the Alaskan oil pipeline before breaking off to run through Canada with one leg going to Antioch, Calif., and the other to Dwight, Ill. The United States and Canada signed a treaty in August approving the pipeline but leaving construction to private industry.

It is estimated the average cost of bringing the gas to the lower 48 states will be $1.05 per thousand cubic feet, at a flow of 2.4 billion cubic feet a day. Alaska's gas reserves are estimated at 26 trillion cubic feet.



The New York Times/Sept. 10, 1977

Sealift to Prudhoe

July 8

SEATTLE (AP)—The icebreaker Arctic Challenger again leads the fleet of eight barges and five tugs in the 10th annual Arctic sealift to North Slope oil fields, says a spokesman for Crowley Maritime.

The 1977 sealift carries a total of 44,000 tons of cargo, including modular facilities for oil processing plants and general cargo for drilling operations, said Roy D. Jurgensen, executive vice president of Crowley's offshore group.

The armada of work vessels was scheduled to leave today.

Arctic Challenger made its debut last year by leading the fleet through the ice to Prudhoe Bay. It also will carry a full deck load of cargo.

The armada will rendezvous near Point Barrow on the northernmost tip of Alaska, which is surrounded by ice except for a period of about six weeks each year.

During that time, sealift crews must tow their barges to Prudhoe Bay, discharge the cargo via a complex system using smaller vessels, or lighters, and sail back past Point Barrow before ice moves in again.

At the end of the 1977 sealift, Arctic Marine Freighters will have delivered nearly threefourths of a million tons of cargo to Prudhoe Bay since the sealift began, Jurgensen said Thursday.

Pan Am Breaks 2-Pole Record

Nov. 1

SAN FRANCISCO (AP) — A Boeing 747 set a new record for its class of jet Sunday by flying around the world, over both the North and South poles, in 54 hours, 7 minutes and 12 seconds.

The 26,706-mile flight marked the 50th anniversary of Pan American World Airways.

On board were 169 passengers. Those in first-class seats had paid $3,333 each, while those in "economy" paid $2,222.

The old record of 62 hours, 27 minutes and 35 seconds was set by a TWA cargo jet in 1965.

The Pan Am jet can make hops of more than 7,000 miles before refueling. Its route was from San Francisco to London via the North Pole, then to Cape Town, South Africa, and over the South Pole to Auckland, New Zealand, and back to California.

The jetliner, named Clipper New Horizons, was the same plane that set a record for going around the world via the Tropic of Cancer in May 1976. It was designed for lower weight and longer range and is 47 feet shorter than the standard 747.

By James A. Arey

When "Clipper 50" eased to the runway at San Francisco International Airport on the evening of October 30, the time clock read: 54.07:12.

At that instant, the cabin of the Boeing 747SP jumbo echoed with a cheer from 172 passengers who had just become part of a new international aviation speed and distance record that will undoubtedly stand for many years to come.

The October 28-30 flight was a fitting windup to Pan Am's 50th anniversary celebration.

Billed as Pan Am's "Polar Expedition," the specially named "Clipper New Horizons" flew around the world via the North and South Poles in a record elapsed time of 54 hours, 7 minutes and 12 seconds. The new mark slashes nearly 8 hours off the previous record of 62 hours, 27 minutes and 35 seconds set in 1965 by a 707.

The globe-girdling journey, which covered a distance of 26,706 statute miles and made stops at London, Capetown and Auckland on its San Francisco-to-San Francisco run, also claimed six other international aviation records, including a spectacular 7,550-mile never-before-done hop between Capetown and Auckland via the South Pole.

All of the records must be certified by the Federation Aeronautique International—the agency which keeps track of such records—but Earl Hansen, the FAI representative aboard the flight, said at the end that "they all look good to me."

As flight 50 taxied to the gate at San Francisco, Capt. Walter H. Mullikin, Vice President & Chief Pilot, who headed the 20-man cockpit team and 50-member flight service staff, got on the Public Address System to announce the final touchdown time.

Captain Mullikin noted that the actual air time for the Polar Expedition was 48 hours, 3 minutes—37 minutes less time than the published 48 hours, 40 minutes that had been planned.

Joseph-Elzéar Bernier was born in 1852 to a nautical family. At age 12 he started work as a shipbuilder and soon went to sea. His father, the captain, believed that once a boy had reached the outer limits of nausea, he would never be seasick again. When the first storm of the voyage arose, young Bernier "was lashed to the windlass on top of the fo'c'sle, where (he) would feel the full effect of the pitching and rolling of the vessel." Released two hours later, he had to finish his duties before collapsing in his bunk. Bernier, however, was not only tough, but also smart, and at age seventeen, he himself became a captain. During a varied career that makes the adventures of Davy Crockett seem dull, Bernier cultivated his growing fascination with the Arctic and stimulated national awareness of the area. As commander of several expeditions aboard the *CGS Arctic*, he claimed islands and established police posts, thereby strengthening Canadian sovereignty in the wild north.

Inuit hunting methods are featured on this quartet of stamps issued by Canada on Nov. 18 to honor the Inuit people of the North.

Canada pays tribute to the Inuit people with a quartet of 12-cent stamps introduced in that country on Nov. 18, advises the Canada Post

One pair of stamps reflects two stonecut prints — one depicts a view of a disguised caribou hunter in a blind, by Lypa Pitsiulak and Solomon Karpik; and the other a walrus hunt, by Parr.

The second pair of 12¢ values features seal hunting in an anonymous Inuit soapstone sculpture, and fishing with spears in a stonecut print by Pitaloosee.

The sculpture is from the collection of the Vancouver Art Gallery. Their vigorous graphic and sculptural portrayals of historic hunting methods have in their imagery the strength and conviction that comes from personal experience and knowledge of the importance of hunting in the daily life of the Inuit.

Few people would flee the comfortable south for the severe Arctic regions, to hunt for a living using methods protrayed on these stamps. The Inuit, however, either mastered the techniques or starved.

Food preferences and hunting systems varied greatly in the vast polar sweep from Alaska to Greenland. Seals and caribou were mainstays of the human diet and were sometimes supplemented by whales, walruses, fish, bears, and birds.

Lacking fresh fruit, the Inuit obtained vitamin C (which cooking destroys) by eating raw meat. Indeed, the word "Eskimo" is an Algonkian term meaning "raw meat eater."

Scurvy often killed early European explorers who were squeamish about uncooked meat. Before dining, however, prudent individuals let the meat freeze to a temperature far below zero degrees Fahrenheit.

This reduced the danger of acquiring a deadly dose of trichinosis, especially from bear or walrus flesh infested with the trichina worm. A meal of rare bear meat killed all but three of members of the Jens Munk expedition to Hudson Bay in 1619-20.

The season determined the proper way to hunt seals. In winter, dogs sniffed out snow-covered breathing holes in the ice. The hunter, sometimes in minus 60 degree weather, then lurked near the hole and harpooned the seal as it came up for air.

To avoid warning the prey, it was essential to remain quiet and to leave unaltered the light pattern reaching the hole.

A line tied to the detachable harpoon head prevented the wounded seal from escaping, but if the line became tangled around a hand, an exceptionally powerful beast could rip off a man's fingers or pull him into the water.

In summer, the hunter pursued seals by kayak, or stalked them as they basked on the ice. Since the seals awoke every 30 seconds, the hunter either hid behind a white screen or pretended to be a seal until his victim dozed off again.

The Inuit were continally plotting against the caribou, spearing them as they crossed rivers, driving them into pounds, and digging pits in the snow for them to fall into.

SOVIET NUCLEAR SHIP REACHES NORTH POLE THROUGH ARCTIC ICE

Icebreaker's Pioneer Trip Seems Aimed at Showing the Ability to Open Vital Far North Routes

By THEODORE SHABAD
The New York Times

Aug. 18

The Soviet Union announced yesterday that its nuclear icebreaker Arktika had reached the North Pole, the first surface ship to break through the Arctic ice pack to the top of the world.

According to press dispatches from Moscow, the 25,000-ton Arktika reached the North Pole at 9 P.M. Tuesday, New York time, in a voyage timed to mark the 60th anniversary of the Bolshevik Revolution this year.

The 460-foot-long icebreaker was under the command of its regular captain, Yuri S. Kuchiyev, and in an evident effort to give the expedition added weight, the Soviet Minister of the Merchant Marine, Timofei B. Guzhenko, was aboard.

Fleet of Nuclear Craft Expanding

The voyage, apparently intended to demonstrate the Soviet Union's increasing capabilities in ice navigation, was performed with the second of a growing fleet of nuclear icebreakers. The first of the series, the 16,000-ton Lenin, has been in operation since 1960; the Arktika entered service in 1975, and the Sibir, a sister ship of the Arktika, is undergoing dock trials at the Baltic Shipyard in Leningrad.

The Soviet Union, the only country with nuclear-powered icebreakers, requires icebreakers to keep some major frozen ports like Leningrad open in winter and provide access to rich resources along the long Arctic coastline.

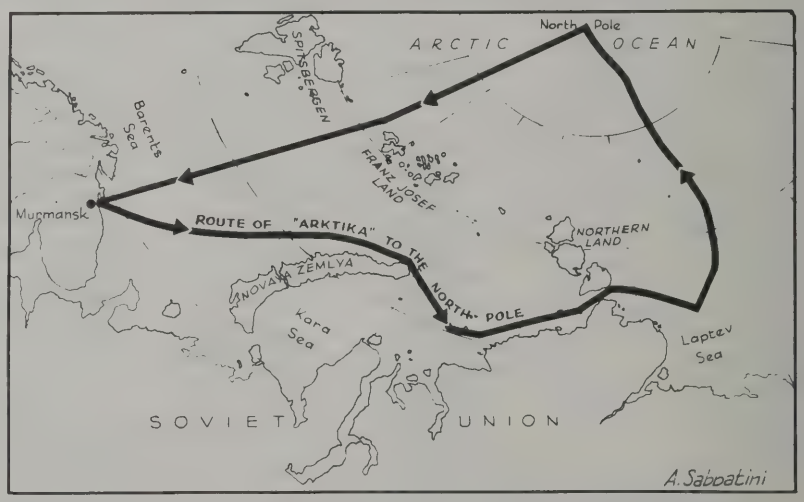
The United States, situated farther to the south and not seriously impeded by icebound coasts, has had a less urgent need for such a capability for economic development, although the Coast Guard operates eight icebreakers for use in Arctic and Antarctic waters. The newest American ships, the Polar Star and the Polar Sea, supplement diesel engines with gas turbines for maximum bursts of icebreaking power.

Canada, too, has been using nonnuclear icebreakers, mainly for winter service in the Gulf of Saint Lawrence, East Coast waters and the Arctic.

Thus far, the Russians have been using their icebreakers mainly to keep open shipping lanes along the icebound northern coast of Siberia, particularly between the large nickel, copper and platinum mines at Norilsk and the port of Murmansk.

Novosti

Icebreaker Arktika first surface vessel to reacn North Pole



Nuclear icebreakers are more powerful than conventional diesel-powered icebreakers and can operate for longer periods before returning to port. The use of the nuclear ships has enabled the Soviet Union to extend its Arctic shipping season from three or four summer months to six months or more along the crucial Norilsk-Murmansk run.

Moscow has been giving priority to prolonging the navigation period because platinum and allied metals figure prominently in Soviet exports to the United States and other Western industrial countries. The Russians are eager to sell these and other natural resources to earn the foreign exchange needed for the purchase of modern Western technology.

In a further effort to extend the Arctic season, nuclear icebreakers were used in the spring of 1976 and again last February to convoy supply ships to a natural-gas development project at Cape Kharasavei on the Yamal Peninsula of northern Siberia.

Other Arctic gas fields, which are also potential foreign-exchange earners, have been developed from the land side, where access was difficult because of the lack of overland transportation. In the case of the Yamal project, the Russians sought to demonstrate that the nuclear ships could carve a path through the ice for freighters even in the winter season. Previously, heavy ice was thought to compel a delay of the convoying season until June.

The newly demonstrated capability may be used by the Russians, for example, to supply ice-floe research stations that are currently being regularly staffed and resupplied by air. By penetrating into the

Arctic interior, icebreakers may now also expand a Soviet network of automated weather stations set up on the ice and add to knowledge about the polar regions.

The first attempt to reach the North Pole by surface ship goes back to Fridtjof Nansen, the Norwegion explorer, whose ice-locked ship, the Fram, drifted through the Arctic in 1893-96, reaching within 280 miles of the pole.

Robert E. Peary of the United States reached the North Pole over the ice in April 1909. His feat was marred by a controversy with Frederick A. Cook, who said he had reached the pole a year earlier, but Congress ultimately decided to recognize Peary's achievement.

With the advent of aviation, two other Americans—Rear Adm. Richard E. Byrd and Floyd Bennett—became the first, in 1926, to fly over the North Pole.

The Russians are not the first to have reached the pole by nuclear power. The United States nuclear submarine Nautilus passed that geographical point under the ice on an undersea voyage across the Arctic in 1958. Two years later, another American submarine, the Skate, managed on its third attempt to find an opening in the pack ice and to surface at the North Pole.

Soviet Icebreaker Begins Return Voyage From Pole

MOSCOW, Aug. 18 (AP)—The Soviet atomic icebreaker Arktika, the first surface ship ever to reach the North Pole, began its return voyage today, Tass reported.

The official Soviet press agency said that before leaving, the crew hoisted the Soviet flag on the icefield at the North Pole and attached a capsule to the staff containing a copy of the proposed new Soviet Constitution and a list of the names of the crew members and accompanying scientists.

The researchers made scientific observations during the ship's 15-hour stay at the pole, Tass said.

The Arktika, whose engines produce 75,000 horsepower, had to break through ice up to 12 feet thick on its trip northward.

Moscow Talks of Gains From Polar Achievement

MOSCOW, Aug. 22 (UPI)—The successful voyage last week of the Soviet nuclear icebreaker Arktika to the North Pole will help revise building techniques for new container ships and more powerful icebreakers, the official press agency Tass said today.

The giant icebreaker, the first surface ship in history to reach the North Pole, left behind a Soviet flag. It was nearing the port of Murmansk today, Tass said, quoting its reporter aboard the vessel.

The agency said that Timofe B. Guzhenko, Minister of the Merchant Marine, had said the Arktika's voyage "marks the start of a qualitatively new stage in the development of the Soviet merchant marine."

Soviet Says Voyage to North Pole Was Hunt for Sea Lanes, Not Stunt

By CHRISTOPHER S. WREN
The New York Times

MOSCOW, Aug. 26—The historic voyage of the nuclear icebreaker Arktika to the North Pole last week was part of a continuing effort to develop a shorter shipping route across the northern Soviet coastline, the expedition's leader said today.

Timofei B. Guzhenko, who is also the Minister of Merchant Marine, denied that the Arktika had undertaken the trip merely to become the first surface ship to smash through to the North Pole. "The Arctic interests us as a national transport route that will insure our country's economic development through shipping," he said at a news conference. "You know that a distinguishing feature of our country is that a significant expanse is in the Arctic."

The Arktika, a Soviet-built 23,500-ton, 460-foot vessel with a thrust of 75,000 shaft horsepower, set out from the northern port of Murmansk Aug. 9, reached the North Pole early on Aug. 17 and returned Monday. Today Mr. Guzhenko and the Arktika's captain, Yuri S. Kuchiyev, reported that they encountered no real difficulties during the dramatic voyage though they crossed the North Pole twice before they finally located it.

Two Decades of Experience

The Soviet Union has amassed extensive experience with nuclear-powered icebreakers in the last two decades. The 16,000-ton Lenin went into service in 1959 and the Arktika two years ago. A sister ship, the Sibir, will be commissioned in a few months. The Merchant Marine Minister said that the Arktika had performed so well that no modifications would be suggested for the Sibir.

The nuclear-powered icebreakers are considered a key to opening the Arctic to commercial shipping. Mr. Guzhenko said that conventionally powered icebreakers could muster no more than 40,000 horsepower while a nuclear-powered one could go well over 100,000. "Nuclear icebreakers can produce huge amounts of energy in a tiny space," he explained. "We are not limited by any factors."

With vast mineral deposits being developed in the remote northern and eastern regions, Mr. Guzhenko said, a shorter route is needed to link east and west. He estimated that if the present shipping lanes from Murmansk to Chukotka, in the Far East, were pushed north by 10 degrees, the journey could be reduced by 30 percent.

"It was this goal that was the main idea of the expedition—to test the reliability of icebreakers like the Arktika and at the same time to conduct scientific research on the question of what transport ships should follow the icebreaker," said Mr. Guzhenko, who noted that nuclear-powered cargo ships would also become a reality within a few years.

On the voyage the Arktika encountered pack ice that the captain said ranged up to 26 feet thick. As a result, he explained, the icebreaker had to zigzag its way north. Mr. Gruzhenko said that the ship could slice through eight feet of solid ice without difficulty and up to 13 feet if there were cracks.

Icebreaker as a Crusher

The icebreaker not only could batter through the ice but also could crush it under its own weight. The Arktika also employed a "heeling" system that helped it shake loose by shifting 1,000 tons of water in ballast tanks from one side to the other. The longest that it was jammed was four hours, the captain reported, adding: "The only worry I had was losing a propeller shaft. Even if we lost one of the three shafts we would have to turn back."

Once at the North Pole the vessel had to determine the precise location with the help of a space satellite, since magnetic compasses do not show true north. "The old method is the sun," the captain said. "Unfortunately, when we approached the pole there was a thick fog. Said We had to spend several hours establishing whether we were at the pole or not."

The Arktika's crew spent 15 hours at the pole before heading home by a new route. The voyage involved 1,300 nautical miles of ice.

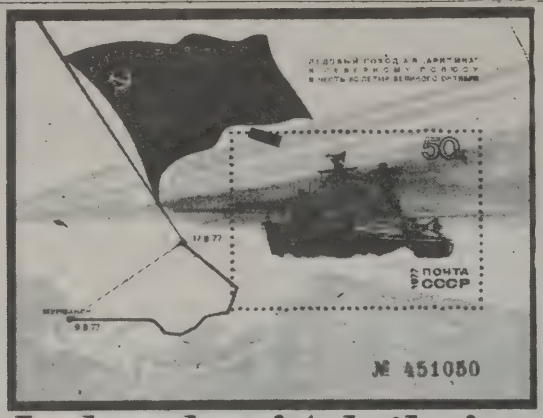
Mr. Kuchiyev said that his crew, which trained for a year and a half, was a group of very tough guys. The 58-year-old captain, a veteran of 40 years at sea, seemed less comfortable when asked about the 20 women who were aboard. "It is not feminine work," he remarked, adding that it was not his job to assign them to the ship. "I do not want to offend women," he said, "but the physical, moral and other loads are too great for them."

North Pole Crew Decorated

MOSCOW, Sept. 14 (Reuters)—The Soviet Union today awarded the title of Hero of Socialist Labor to the captain and five other men involved in the conquest of the North Pole last month by the atomic icebreaker Arktika. Orders of Lenin were given to 10 others who helped with the expedition, with lesser awards going to over 300 more.

Soviet Test Indicated

WASHINGTON, July 29 (Reuters)—Seismic signals presumed to be from a Soviet underground nuclear explosion were picked up by the American atomic energy detection system, the United States Energy Research and Development reported today. It said the signals were recorded Tuesday and originated from central Siberia, north of the Arctic Circle, where the Russians have an underground testing area.



Icebreaker 'Arktika'

The Soviet atomic "Arktika's" arrival at the North Pole is honored on a 50-kopeck miniature souvenir sheet introduced by the Union of Soviet Socialist Republics Sept. 15. The numbered sheet depicts the icebreaker with a schematic map of the route through ice packs from Murmansk to the North Pole. The multicolor sheet, designed by A. Aksamit, was printed in offset.

Russia Breaks the Ice

The New York Times

"The eternal dream of generations of sailors and polar explorers has been realized," Soviet television announced last week after the Soviet Union's nuclear powered icebreaker Arktika became the first surface ship to reach the North Pole.

The achievement was timed to coincide with the 60th anniversary of the Bolshevik Revolution, and the announcement called it "an outstanding new victory of Soviet science and technology." In addition to its prestige value, the feat does have both scientific and economic significance.

The 25,000-ton, 460-foot Arktika is one of the Soviet Union's three atomic icebreakers. Their most important function is to extend the Arctic shipping season beyond summer. For instance, the lanes between Murmansk and Norilsk, where there are large deposits of copper, nickel and platinum, are now being kept open for half the year. Further extension may become possible as the Soviet Union's ice navigation capability increases.

The country has also begun using icebreakers in spring and winter to convoy freighters to newly opened natural gas fields on the Yamal Peninsula, which is inaccessible by land and was formerly considered unreachable by sea before June.

In addition, the Soviet Union's icebreakers play a role in the nation's Arctic studies program. The Arktika's accomplishment may enable the Russians to supply their floating ice research stations by sea instead of by air, and it may now become possible to expand Russia's existing system of weather stations.

The Soviet Union is the only country with nuclear icebreakers. Lying farther south, the United States has less economic need of them. However, the Coast Guard runs eight conventionally powered icebreakers in Arctic and Antarctic waters.

The Norwegian explorer Fridtjof Nansen was the first to try to reach the North Pole by surface ship. His goal was not to cut through the Arctic ice pack but to drift with the current, and his ship, the Fram, came within 280 miles of its destination. The pole was first reached over the ice by Robert E. Peary in 1909, by Rear Adm. Robert E. Byrd in an airplane in 1926, and by the American nuclear submarine Nautilus in 1958. Aug. 21

Ice-breakers of the Soviet Union are spotlighted on a series of seven stamps launched on July 27 from the U.S.S.R.

The U.S.S.R. continues its postal recognition of the "Ice-Breaker Fleet of the Soviet Union" with the release of a set of seven stamps on July 27, advises the country's philatelic department.

The designs of A. Aksamit are reproduced in multicolor offset printing combined with metallography.

The "Aleksandr Sibiryakov," build in 1932, sailed for the first time along the Northern Sea Route from Archangel to Vladivostok in one navigation season. It is featured on the 4-kopeck stamp of the series.

The 6kop denomination depicts the "Georgi Sedov," which has participated in many exploratory expeditions of the Arctic seas. She drifted for 812 days in 1937-40 in the polar basin gathering scientific materials.

The "Sadko," another icebreaker that carried out high latitude research expeditions in 1939-41 is the subject of the 10kop stamp.

Built in 1938 at the Baltic shipyard in Leningrad, the "Dezhnev," depicted on the 12kop emission, serviced Arctic navigation in the western sector of the Soviet Arctic.

Built at the same time as the "Dezhnev," the icebreaker "Sibir" (Siberia) is known as the ship that led the "G. Sedov" out of the ice during the polar night upon completion of its historic drift (shown on the 6kop value). The "Sibir" is the subject of the 14kop denomination.

The "Lena," a diesel-electric ship, is shown on the 16kop stamp of the series. She is known for her high speed and role in the comprehensive exploration of the Arctic Ocean, and in her cargo shipments along the Northern Sea Route.

Built in 1962, the diesel-electric "Amguyema" is featured on the 20kop stamp. She was designed and built for handling Arctic shipping.

Each of the ships is placed in an oval frame against an Arctic landscape on the stamps.

Station Changes Hands

BARROW (AP) — The Coast Guard has turned over its radio station at Point Barrow to the Naval Arctic Research Laboratory.

Since it first went into operation in 1972, the station had played a major role in Coast Guard arctic communications and as a link with drifting Ice Station T-3.

The Coast Guard said it will maintain two radio transceivers at the RCA satellite earth station in Barrow, operating them by remote control from Kodiak.

It was on Oct. 10, 1975, that the first vehicle crossed the first bridge built across the Yukon River, 500 miles south of Prudhoe Bay oil fields. It opened accesss to the North Slope and made Northern Alaska exploration of petroleum and mineral resources practical.

A Bugged Polar Bear

About 40 miles north of Point Barrow roams a polar bear who's wired into the electronic age.

It's not the bear's doing.

Blame Jack Lentfer, if you must.

Lentfer, a wildlife research biologist with the U.S Fish and Wildlife Service, is the man primarily responsible for a tagging project that is literally out of this world.

The bear, known only as No. 1795 in reference to its project number, wears a collar fitted with a transmitter. The signal is bleeped to a NASA Nimbus Six satellite, which passes the North Pole every 108 minutes. Seconds later, that same signal is picked up at a receiving station near Fairbanks.

There the data are interpreted and, presto, scientists pinpoint the bear to within two miles of its actual location. A few days later Lentfer picks the data out of the morning mail at his Anchorage office and muses, for instance, whether No. 1795 might be following a population of ringed seals, a dietary staple.

"It's ranging around 100 miles back and forth," said Lentfer, who hopes No. 1795 will unlock new information on the range, denning habits and feeding patterns of polar bears. "We hope we're able to go in and check up on her (at closer range) this fall, but no matter what happens we'll learn something."

Alaska airlift

Oct. 5

LITTLE DIOMEDE, Alaska (AP)—An Eskimo teenager with acute appendicitis was airlifted off this tiny island by helicopter yesterday after health officials gave up trying to obtain clearance from Soviet authorities to land a fixed-wing aircraft on neighboring Big Diomede.

New Issues For Famous Seafarer

Two commemoratives are being issued simultaneously Jan. 20 in Honolulu and Anchorage to pay tribute to Capt. James Cook, one of the greatest explorers the world has ever known, and to mark the 200th anniversary of his third voyage of discovery that brought him to what are now the present states of Hawaii and Alaska.

In his third voyage, after having explored the reaches of the Pacific and the Antarctic, Cook undertook in 1776 to explore the northern Pacific and the western coast of America for a possible northwest passage. Sailing from England, he rounded the Cape of Good Hope and visited a number of islands, including New Zealand, the Cook Islands, Tonga and Tahiti, and then, late in 1777, sailed northward. On Jan. 20, 1778 his ships put in at the Hawaiian island of Kauai, landing at the village of Waimea, and after some days went on to the island of Niihau.

From there the ships sailed north, seeking the northwest passage from the Pacific rather than the Atlantic side. Cook reached the American coast, sailed along the shores of Oregon, Washington and Canada, and on June 1, 1778 anchored in the body of water now known as Cook Inlet, near the present city of Anchorage. Cook went on through the Bering Strait and northward until halted by pack ice. He returned to winter in Hawaii. On Feb. 14, 1779 he was killed in a scuffle with some natives.

The Alaska stamp is a vertical portrait. The Hawaii stamp is a horizontal seascape picturing Cook's ships, the "Resolution" and the "Discovery," anchored at Hawaii. The inscriptions are similar to type style and usage of 1778, even to the abbreviation of Cook's rank.

The portrait is the only one of Cook done from life, when he sat for Nathaniel Dance in 1776 just prior to his third voyage. The design is the work of Robert F. Szabo of Yale.

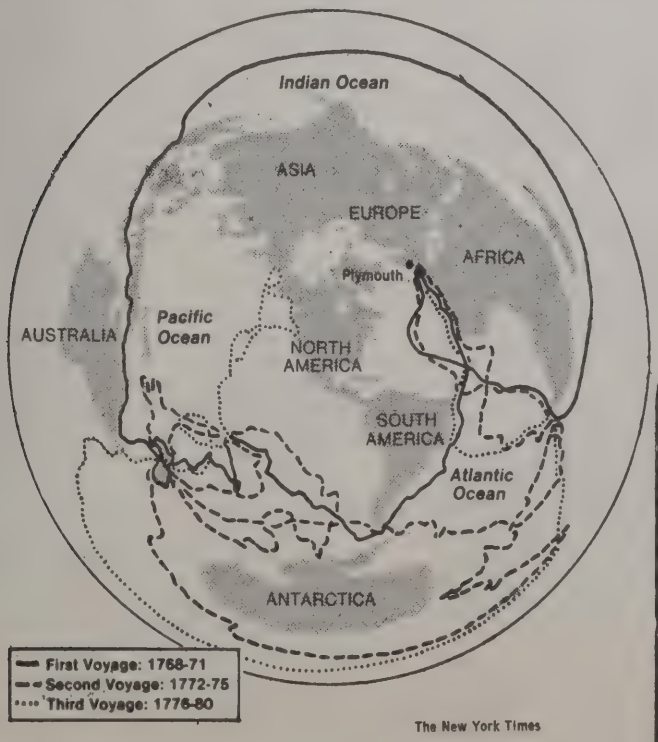
James Cook, 1728-1779, has been described as the man who "in a peaceful manner changed the map of the world more than any single man in history." In three great voyages from 1768 to his death he crossed and recrossed the unknown Pacific and Antarctic, meticulously charting islands and coasts, turning the vastness into the map known today.

He was the first of the scientific navigators and his voyages made contributions of immense value in many fields of knowledge in addition to geography, from astronomy and botany to zoology. He was even a student of dietetics, and demonstrated on his second voyage that scurvy, the principal cause of death on British ships, could be eliminated by proper attention to diet. He was also one of the first anthropologists, studying the customs and tongues of the natives wherever he explored.

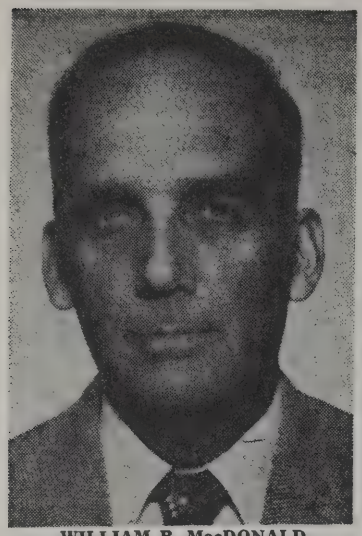
The son of a Yorkshire farm worker, the self-educated Cook turned to the sea at the age of 18 and rose from able seaman to captain in the British Navy on his merit. His earlier skill in charting the St. Lawrence River and the coasts of Newfoundland and Labrador won him in 1768 the command of the first scientific expedition to the Pacific.

This first voyage was organized by the Royal Society in cooperation with the British Admiralty "to observe the transit of the planet Venus across the sun" and to find the so-called "Terra Australis."

In his second voyage of 1772, Cook set out to find out if there was a great continent in the southern Pacific southeast of Australia. During this voyage he was the first known person to penetrate and circumnavigate the Antarctic and to explore and chart many of the islands of the South Pacific familiar to stamp collectors.



The New York Times



WILLIAM R. MacDONALD

William R. MacDonald, 52; Aided In U.S. Mapping of the Antarctic

The New York Times

WASHINGTON, Nov. 10—William R. MacDonald, who was instrumental in the mapping of the Antarctic, died yesterday in Annapolis, Md. He was 52 years old.

Mr. MacDonald was chief of international activities for the United States Geological Survey's topographic division.

He first became involved in the mapping of Antarctica in 1954 while working in the Geological Survey's special maps branch, where he used aerial photography to produce maps.

In the 1960's, he planned all aerial photographic flights for the Navy when the United States photographed about a million square miles of the Antarctic for mapping purposes.

MacDonald Peak in Antarctica was named for him in 1961 in recognition of his mapping achievements.

Mr. MacDonald, who was born in Laurel, Md., is survived by his wife, Beatrice; his mother Ella May MacDonald of Washington; a sister, Ethel Louise Wooten of Forrestville, Md., and a brother, Duncan J. MacDonald of Garret County, Md.

Robert Porsild, 79, dies

Robert Porsild, 79, A Yukon Territory pioneer and botanist, died Dec. 30 at his home in Whitehorse.

He was born Dec. 28, 1898 in Copenhagen, Denmark, and studied biology and botany at the university there. In the summer of 1926 he came to Alaska to study reindeer husbandry. Throughout the following years he traveled extensively through Canada and Alaska collecting botanical specimens.

In 1949 he opened a lodge at Mile 837 on the Alaska Highway at Johnson's Crossing.

After retiring in 1965 he became the president of the Golden Age Society in Whitehorse. He was also a founding member of the Lutheran Church there. He is survived by his wife, Elly, of Whitehorse, and by three daughters.

The Center for Polar Archives

National Archives and Records Service
General Services Administration
Washington, DC 20408

The Center for Polar Archives was formally opened concurrently with a conference on polar archives held in the National Archives Building on September 8, 1967. Proceedings of the conference were published in *United States Polar Exploration*, edited by Herman R. Friis and Shelby G. Bale, Jr. (Athens: Ohio University Press, 1970). The Center is designed to serve as a depository for gifts of papers from individuals and institutions as well as for records of the U.S. Government pertaining to exploration, research, and other activities in the arctic and antarctic regions. The primary objectives of the Center are to preserve, arrange, and describe polar-related records and papers and to facilitate research in polar history.

A recent book based upon Polar Archives' holdings is *The Arctic Diary of Russell Williams Porter*, Herman R. Friis, ed. (Charlottesville: University Press of Virginia, 1976). This large (9¼" x 10¾"), handsome volume is a compilation of Porter's diaries written during his voyages to Greenland and the Arctic, 1894-1906, combined with explanatory notes. More than 80 drawings and maps of then uncharted regions are reproduced from Porter's expedition sketchbooks, including revealing studies of Greenland Eskimos, arctic wildlife, and ice-bound vessels. Some drawings are in color.

Historical Background

American explorers have been active in the polar regions for over 150 years. The records of their activities are as numerous as the subjects of investigation are wide ranging. It is important that these records and papers be preserved as part of the Nation's heritage.

As early as 1789 John Churchman, a surveyor-mathematician, proposed to the First Congress that the Federal Government sponsor a scientific expedition to Baffin Land to investigate high latitude magnetic variations. The Congress did not appropriate money for this scientific challenge and continued to deny money for polar exploration for many years. During the first half of the 19th century, U.S. merchants approached the Arctic and Antarctic in search of profit from whaling, sealing, and the China trade. Around the middle of the 19th century the Federal Government became more active in the polar regions as national pride and prestige became involved in scientific and geographical discoveries. Since the late 19th century the growing polar activity of both the U.S. Government and individual citizens has been primarily motivated by the need to understand our total world environment.

Early activities of the Federal Government included surveys by the U.S. Navy in high latitudes, 1825-40; surveys of the periphery of the Antarctic Continent by the U.S. Exploring (Wilkes) Expedition, 1838-42; observations in high latitudes by ship captains in response to Matthew Fontaine Maury's program of compiling nautical and related charts while he was Superintendent of the Navy's Depot of Charts and Instruments; the U.S. Arctic (Navy-Grinnell) Expeditions of 1850-51 and 1853-55; the ill-fated exploring expedition of the U.S.S. *Jeannette* in the ice of the Arctic Ocean, 1879-82; and the Lady Franklin Bay Expedition under Adolphus W. Greely, 1881-84, conducted as part of the U.S. contribution to the first international polar year. Later Government-sponsored activity in the polar regions has included the pioneering U.S. Navy flights in northwestern Greenland and Ellesmere Island by Richard E. Byrd in 1925; the U.S. Antarctic Service Expedition, 1939-41, under the command of Byrd; and the many and varied activities of the U.S. Navy, Air Force, Army, Coast Guard, Weather Bureau, and other Government agencies in the Arctic during the 1940's and 1950's. Among such activities were those at Camp Century in Greenland and at the scientific stations on floating ice islands, those during the "Ptarmigan" meteorological flights to the pole, and those at the DEW line and JAWS stations. More recent activities have included the under-ice cruise of the nuclear submarine U.S.S. *Nautilus* from Bering Strait to the North Pole and return in 1958.

Each year since 1955, the U.S. Naval Support Force at Antarctica has provided logistic support to the U.S. Antarctic Research Program, which is administered by the National Science Foundation through its Division of Polar Programs.

Equally important have been the privately sponsored expeditions and scientific research activities that often pioneered the way to successful investigations of polar environments. Among these were the voyages of the early sealers, whalers, and China traders; the first two expeditions of Charles Francis Hall to the Arctic in the 1860's; Robert E. Peary's explorations for reaching the North Pole, 1885-1909; Byrd's 1926 flight to the North Pole from Spitsbergen and his expeditions to Antarctica in 1928 and 1933; the important voyages of exploration into the North American and Greenland Arctic by Robert A. Bartlett, Louise A. Boyd, Lincoln Ellsworth, Donald B. MacMillan, Vilhjalmur Stefansson, and Hubert Wilkins; and the last private U.S. expedition to Antarctica—the Ronne Antarctic Research Expedition, 1946-48. To these should be added the varied scientific programs of such organizations as the American Geographical Society, the National Geographic Society, and the Arctic Institute of North America.

Holdings of the Center for Polar Archives

The National Archives and Records Service (NARS) and its Center for Polar Archives contain rich sources of information on the history of U.S. activities in the Arctic and the Antarctic from the 18th century to the present.

Prominent among the official records of the U.S. Government in the Center are the records of

the U.S. Antarctic Service, 1939-41; the records of the U.S. Naval Support Force, Antarctica, 1955-73; and the records of the Division of Polar Programs and its predecessors, National Science Foundation, 1959-74. There are additional Federal records in a number of other record groups in the Center. Among the donated papers are those of the following:

American Society of Polar Philatelists
Archibald, Donald
Bailey, Alfred M.
Balchen, Bernt
Barter, Leland L.
Biederbick, Henry
Black, Richard B.
Boyd, Louise A.
Brown, Dayton R.
Bucher, Walter H.
Burrill, Meredith F.
Canham, David W.
Carlson, William S.
Clark, George H.
Clarke, Arnold H.
Coman, Dana
Conger, Richard R.
Corey, Stevenson
Court, Lee W.
Czegka, Victor H.
Dalrymple, Paul C.
Dater, Henry M.
Davidson, James W.
Davies, Frank T.
Davis, Robert N.
Delabarre, Edward
Delong, Emma W.
Demas, Epaminondas J.
Dorsey, Herbert G.
Douglas Aircraft Company
Dyer, John N.
Educational Broadcasting Corporation
Eklund, Carl R.
Ellsworth, Lincoln
Fitzgerald, Charles G.
Friis, Herman R.
Geographical Society of Philadelphia
Goodale, Edward E.
Gould, Laurence M.
Grimminger, George
Gschwind, Florence E. Paullin
Haines, William C.
Handy, Dora Keen
Hanessian, John
Harrison, Henry T.
Hassell, Bert R. J.
Honkala, Rudolf A.
Howard, August & Rose
Hubbard, Charles J.
Hubbard, Thomas
Humble Oil & Refining Company
Hunt, Harrison J.
Jenks, Shepherd
Jones, Roy F.
Kellogg, Remington
Kent, Rockwell
Langone, John
Lee, Hugh J.
Lillestrand, Robert L.
Lindblad Travel, Inc.
Lindsey, Alton A.
Llano, George A.
Long, Elgen M.
Lund, Ruby P.
MacDonald, Edwin A. & Jessie Bell
MacMillan, Donald B.
Malterner, Silas Nott
Martin Marietta Corporation
McClary, Jane M.
Mogensen, Palle
Mooney, James E.
National Film Board of Canada
Nef, Evelyn Stefansson
Neuberg, Hugo A. C.
The New York Times
Oscanyan, Paul C.
Pagano, Gerald
Patronick, Joseph
Peary, Robert E. & Josephine D.
Perkins, Anson W.
Perkins, Earle B.
Perry, John E., Jr.
Pope, John A.
Porter, Russell W.
Poulter, Thomas C.
Rawlins, Dennis
Remington, Edwin W.
Ronne, Finn
Roos, S. Edward
Saunders, Harold E.
Schlossbach, Isaac
Schneider, Leonard R.
Seelig, Walter R.
Siple, Paul A. & Ruth J.
Smith, Philip M.
Stefansson, Vilhjalmur
Stewart, Duncan, VII
Sullivan, Paul
Thomas, Charles W.
Turner, Mortimer D.
Tyson, George E.
Waite, Amory H.
Ward, Charles Henshaw
Warmbath, Julian S.
Watt, Robert C.
Wiener, Murray A.
Willard, Berton C.
Wilson, John Wall
Wilson, Leonard S.
Wood, Robert W.
Woods. Lawrence C.

These records and papers include correspondence, biographical information, scientific and other observational data, journals, diaries, personal accounts, reports, memorandums, manuscript research papers and printed publications, maps and charts, still pictures, aerial photographs, sound recordings and motion pictures, and sketches and paintings.

Polar-related information in the National Archives of the United States may be found in approximately 50 record groups. Especially rich are those that describe U.S. Navy exploration and research. These are among records of the Hydrographic Office, the Naval Observatory, the Office of Naval Records and Library, and Naval Operating Forces. Further information on exploration and research may be found among the U.S. Coast Guard records. Early scientific polar data are among records of the Coast and Geodetic Survey, the Weather Bureau, and the Office of the Chief Signal Officer. Information of a descriptive and administrative nature is found with records of the U.S. Senate and House of Representatives, the Office of Territories, and the Bureau of Insular Affairs.

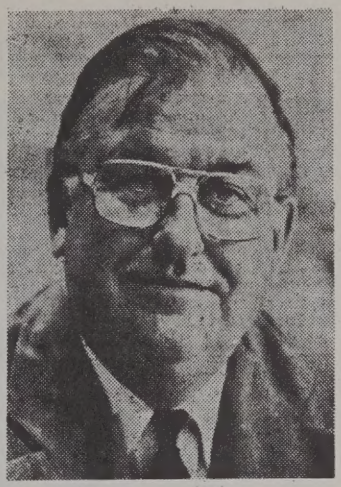
The primary goal of the Center is to collect and preserve official Government polar records and papers of U.S. citizens and corporations engaged in polar activities. The preservation of records and papers is useless unless they are consulted for research; therefore, an equally important goal of the Center is to facilitate and encourage their use. In order to do this, the staff of the Center arranges and describes the records and papers that constitute its holdings.

In addition, the Center staff locates and identifies polar records in other divisions of NARS and in other Government agencies and depositories. The Center staff engages in a variety of research and publication activities and maintains close contact with Federal agencies that have polar responsibilities.

The Center replies to oral and written requests for information about its holdings and related records, including those elsewhere in NARS. A research room and polar book collections are available to researchers who visit the Center. Copies of records and papers are available for a fee.

Persons wishing information about making gifts of polar papers and other historical materials should direct their inquiries to the Center for Polar Archives, National Archives Building (GSA), Washington, DC 20408. Because of its extensive holdings of Federal polar records and its optimum physical environment in the National Archives Building, the Center for Polar Archives is an ideal depository for papers relating to the polar regions. The papers are kept in the Center's stack area, which is protected by firewalls and by automatically controlled temperature, humidity, and alarm systems. Instructions for shipment of papers at no expense to the donor will be provided

In general, the Center prefers to accept unrestricted gifts, that is, papers and other historical materials donated without restrictions on access or copying and with the assignment of literary property rights to the United States. As an exception, a reservation of literary property rights in specific manuscripts may be made by the donor. Other specific restrictions may be agreed to in the interests of the protection of personal privacy and the security and foreign relations of the United States.



Dr. Bruce C. Heezen

Bruce C. Heezen dead at 53

Bruce C. Heezen, whose pioneering work in mapping the ocean floors encompassed the southern ocean, died 21 June 1977 of an apparent heart attack. He was aboard the U.S. Navy research submarine *NR-1* about to explore the mid-Atlantic mountains of the Reykjanes Ridge southwest of Iceland.

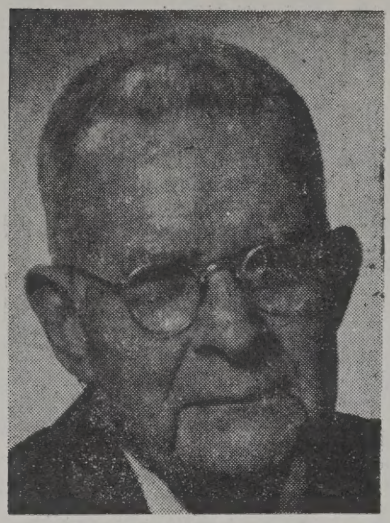
Dr. Heezen was associated with Lamont-Doherty Geological Observatory of Columbia University since its founding in 1949. His many important discoveries in marine geology included description of the role turbidity currents play in shaping the sea floor. Dr. Heezen and his co-worker, Marie Tharp, also of Lamont-Doherty, authored a set of physiographic maps of the world's ocean floors that were distributed by the National Geographic Society.

Dr. Heezen and Ms. Tharp were co-representatives aboard USNS *Eltanin* cruise 55, from October to December 1972, in the southern Indian Ocean. Together they and Charles R. Bentley, University of Wisconsin, wrote *Antarctic Map Folio Series*, 16 ("Morphology of the earth in the Antarctic and Subantarctic"). Dr. Heezen published over 100 research papers and co-authored at least two books, *The Floors of the Oceans* (with Maurice Ewing and Ms. Tharp) and *The Face of the Deep* (with Charles D. Hollister).

Ocean Patterns to Be Studied

Washington (UPI) — The National Science Foundation yesterday announced a study program on how ocean circulation patterns evolved and how they affect global sedimentation processes. Scientists from 11 research institutions will take part in the four-year study of the evolution of polar glaciation and the effect on life of changes in the ocean. Nov. 1.

W.L. Schmitt



WALDO L. SCHMITT

WASHINGTON, Aug. 11

Waldo L. Schmitt, 90, retired curator of biology at the Smithsonian Institution, who was known as one of the institution's "grand old men," died Friday at the Friends House nursing home in Sandy Spring after an illness of several months.

A specialist in decapoda, the order of crustaceans that includes lobsters, shrimp and crabs, Dr. Schmitt worked for the Smithsonian for 43 years before his official retirement in 1957, but continued to work there afterward.

He traveled the world in search of specimens, making his last collecting trip in 1962 to Antarctica, where a 30-mile series of ice-covered outcroppings is named Schmitt Mesa in his honor.

In the late 1930s, Dr. Schmitt's expert knowledge of the marine life along the coast of South America was brought to the attention of President Franklin D. Roosevelt, when the President was considering a fishing trip to the area.

Of all the voyages and expeditions made by Dr. Schmitt, he said he enjoyed most the one that he and the President made in 1938 to the Galapagos Islands, off the coast of Ecuador.

Dr. Schmitt was born in Washington. His interest in biology and wildlife was nurtured by the works of naturalist Ernest Thompson Seton and weekly hikes with an uncle in search of specimens in Montgomery and Prince George's Counties.

While working at his first job with the Agriculture Department, he began attending George Washington University at night, and earned an undergraduate degree in 1913. He joined the Smithsonian in 1914, and received a Ph.D. from George Washington in 1922.

United Press International

FROZEN REMAINS UNEARTHED: Researchers in Leningrad examining the frozen remains of what they believe to be a baby mammoth that died about 10,000 years ago. The body was found at an excavation site in northeastern Siberia in June. It will eventually be stuffed for museum display.

Polar bear devours Austrian

OSLO, Norway (AP)—A 33-year-old Austrian tourist on a camping trip in the fjords was killed and eaten by a polar bear, Norwegian authorities reported today.

Fourteen other campers in the party of 15 who pitched tents near the Magdalena fjord north of Spitsbergen were rescued by helicopter after the Monday attack.

They told authorities that the group was asleep inside their tents when they heard a scratching noise. Their comrade went outside to check on the noise and was immediately attacked by the bear.

The other campers, armed with ice axes and ski sticks, rushed to rescue their friend from the bear's clutches but the animal dealt a heavy blow to one of them and they were forced to flee.

The campers climbed on to a nearby glacier and watched helplessly as the bear carried their friend to an ice floe in the fjord and devoured him.

When Norwegian authorities arrived at Spitsbergen to investigate the attack, they found only small traces of blood. The man's clothes had vanished.

In a similar incident in 1971, a Norwegian working at Bear Island near Spitsbergen was killed by a polar bear. And in 1976, a Russian worker lost one his ears after escaping an attack in the mining town of Barentsburg July 21

Skua Scoots to Pole for Brief Stay

Those who say the South Pole is for the birds are expressing an opinion, not a fact. Actually birds are most uncommon at the pole because there is nothing to sustain them.

Therein lies the reason for unusual interest in a teletype message from that most remote outpost, which reported that H&Ner Rick Healy had sighted one of the South Polar Skuas at Amundsen-Scott South Pole Station, and the bird had been photographed from within three meters before it flew away.

The Skua is a scavenger, well known for its predations on penguin rookeries. However, he'll find no penguins at the South Pole, or any other source of food for that matter.

Adding interest is the fact that the nearest known nesting site of the Skua is about 830 miles away, in the vicinity of McMurdo.

Keep watching for the Eagle of the Antarctic, Rick. Maybe he'll return and provide some answers to obvious questions.

Whaling Group Increases Quota on Allowable Killing

TOKYO, Dec. 6 (AP)—The International Whaling Commission bowed to pressure from Japan and the Soviet Union today and voted 14 to 1 to raise the quota of sperm whales that may be killed in the northern Pacific from 763 to 6,444, members of national delegations reported.

The decision was made at the opening of a two-day closed session of the 17-nation commission. France cast the sole dissenting vote and Panama and Brazil were absent, the sources said.

The quota last year was 7,000 but the commission decided in June to fix the next quota at 763. Japan and the Soviet Union opposed the reduction and asked for the special session.

The commission was also scheduled to discuss its ban earlier this year on the killing of bowhead whales, an endangered species that Alaskan Eskimos hunt for food.

Sperm Whale Quotas Cut

TOKYO, Dec. 14 (Reuters)—Japan and the Soviet Union, the only countries that hunt the sperm whales of the North Pacific, have agreed to reduce their catches for next year in accord with a decision by the International Whaling Commission, it has been announced here. Japan's quota will be 2,754, compared with this year's limit of 3,078, while the Soviet Union will have a quota of 3,690, a drop of 432, the fishing agency said.

Congress Votes Year's Extension Of Law Protecting Sea Mammals

WASHINGTON, Oct. 5 (UPI) — The House passed today and sent to President Carter a one-year extension of the law protecting such marine mammals as whales, seals and polar bears.

The legislation authorized $15.7 million to carry out the 1972 Marine Mammal Protection Act for one more year. It was passed by voice vote a day after clearing the Senate.

Congress enacted the law in response to public concern about the growing dangers faced by whales, dolphins, seals, sea otters, polar bears and other marine mammals. The law authorized the Interior and Commerce Departments to put limits on the killing of such marine mammals, prescribed civil and criminal penalties for violators, and created a Marine Mammal Commission to monitor enforcement.

The new bill, covering the fiscal year 1978, authorized $11.7 million for the Commerce Department, $2 million for the Interior Department and $2 million for the commission.

The estimated population of the western arctic herd of caribou has dropped from 250,000 to between 60,000 and 50,000 over the past six years, says National Geographic. This crisis threatens the people in Alaska's inland villages, where hunters still depend heavily on caribou for food in the winter.

Musk Ox Project Comes to End

With the shipment to Unalakleet this past summer of the remaining 80 animals on the Fairbanks farm, the university's 13-year musk ox domestication project came to its planned conclusion.

The 142-acre farm may not have seen its last musk ox, however. University scientists hope to bring more of the intriguing animals to Fairbanks from Nunivak Island at some time in the future, but for a different purpose: research rather than domestication.

The Fairbanks domestication project, financed by the Kellogg Foundation, was directed from the beginning by John J. Teal. Its long-range goal was to provide selected tundra-coastal native villages with herds of domesticated musk oxen which would become the basis for local industries employing men as herdsmen and women as knitters of high quality items of apparel made of the fine underwool of the musk ox.

The musk ox project was started in 1964 with 33 calves—23 females and 10 males—captured by Teal on Nunivak Island and flown to Fairbanks.

Rainbow Trout Planted In Prudhoe Reservoir

Workers at Prudhoe Bay may one day be seeking trout as well as oil.

Three thousand fingerling rainbow trout have been planted in Webster Reservoir at Prudhoe Bay, about a half mile from the Atlantic Richfield Co. (Arco) operations center.

Arco said the research project is being conducted in conjunction with the Alaska Department of Fish and Game to determine whether rainbow trout can survive in the Arctic environment.

Conducting the experiment are Angus Gavin, arctic ecologist, and George Van Whye, Fairbanks regional supervisor for the state Department of Fish and Game. Gavin was commissioned by Arco in 1969 to study the environment and wildlife of the North Slope.

Webster Reservoir, which Arco escavated to 27 feet deep for emergency water storage, is maintained with a 3.1 million gallon capacity. The ice reaches a depth of about seven feet during the winter. Most lakes at Prudhoe are shallow, averaging four feet in depth.

Gavin said there are lots of larvae and insects for trout food, and prospects are good for the trout's survival over the winter.

Seals Fly In Chilly Comfort

A pod of 10 full grown Pribilof Island fur seals passed through Anchorage last night on their way to new homes in the Lower 48.

Two of them will live at a Seattle naval aquarium, and the rest were bound for another government research aquarium in Connecticut.

Dr. Mark Keyes, marine mammal research veternarian with the National Oceanic and Atmospheric Administration, collected the seals and accompanied them as far as Seattle. Two biologists were to escort the rest of the animals to the East Coast.

The seals rode to Anchorage in individual cages aboard a Reeve Aleutian Airways Lockheed Electra, with cabin temperature set on the chilly side for their comfort and convenience.

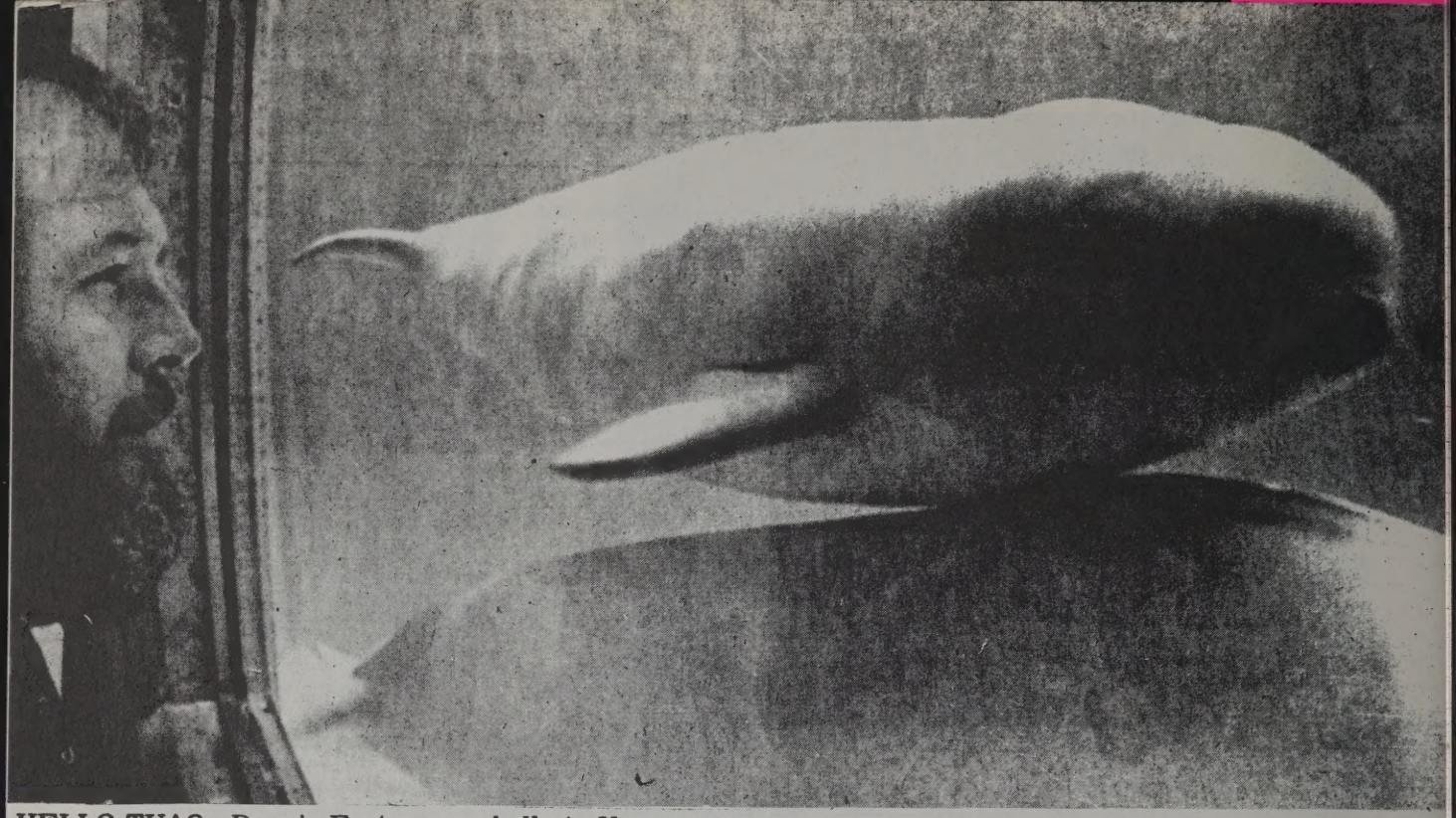
Passengers were seated in the rear of the plane, and the caged seals occupied the area just aft of the cockpit, with Keyes and the two biologists in close attendance.

"They took the trip surprisingly well," Capt. Grant Forsythe said. "They weren't particularly noisy and they didn't seem to be in distress."

Once unloaded at Anchorage International Airport, the seals were kept outdoors in their cages, and escorting biologists sprayed water on them to cool them off.

They continued their trip south aboard a Western Airlines plane about 1 a.m. today.

Keyes, a Seattle resident, has been associated with the Pribilof Island seal study project for a number of years. Oct. 13



HELLO TUAQ—Dennis Foster says hello to Vancouver, B.C. Public Aquarium's baby beluga whale who will be known as Tuaq (TOO-ak), the Eskimo name that Foster submitted to the name-the-baby-whale contest. Tuaq is the first beluga whale in North America to survive for more than a few hours after birth in captivity.

A large male polar bear is in an intermediate stage of immobilization from an anesthetic. Polar bear studies were part of a cooperative research program providing data on population, movement, denning and reproduction, growth rate, and other data.